The Builder.

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Continental Activity.

MUCH activity in Building and Artistic matters is obvious abroad, and has been so for some time, as our readers must have observed. Notices of fresh works and doings have reached us from various quarters, and we will throw some of them together here, to give the feature prominence. Let us look first to

Italy.—The municipal authorities at Florence are at this moment very active in taking the preliminary steps for a considerable enlargement of what may, *for the present*, be considered the Italian capital. These steps seem to be the result of well-digested plans based upon the opinions of numerous local architects and engineers, whom the authorities have been neither too wise nor too proud to consult. In the direction of Fiesole both San Domenico and Badia will become part of the city. A further extension in this direction would not be practicable, as the valley north of the Ponte Alla Badia becomes so narrow, as barely to allow of the passage of the Mugnone, which often, particularly in the winter, comes rushing down with great violence between the Lastra and the heights of Fiesole; whilst the hills themselves are too steep for convenient thoroughfare. Towards the south, the extension will include the Villa Poggio Imperiale, which is now reached by the beautiful *allée* of cypresses leading from the Porta Romana. The old walls and fortifications will be laid out in walks and gardens, after the manner of Vienna and other continental cities; the streets leading to the Pitti Place, the Via dei Martelli towards the Riccardi Palace; and, lastly, the Bridge alla Carraja, are all in process of being considerably widened. For those who know or have known Florence well, we may quote from the *Nazione* a list, showing how it is proposed to utilize existing buildings for Government offices. Chamber of Deputies, the Hall of the Five Hundred; offices of the Deputies, Palazzo Vecchio; Senate, Hall of the Dugenti; Foreign Affairs, Palazzo Vecchio; Public Education, Riccardi Palace; War, the Bishop's College beyond the Arno, with additions in present garden; Finance, Casino di Medicis; Home Office, the buildings known as the Santa Caterina Barracks; Public Works, Institute of the Santa Annunciata; Admiralty, Barbetti Monastery; Justice, Palazzo Ceparello; Agriculture and Commerce, Poggio Imperiale; Public Debt, Santa Croce Convent; State Council, a palace now in course of completion; Committees of Artillery and Engineers, Monastery of Santo Spirito; Post, Monastery of San Firenze; the Royal Carabinieri, Military College of Borgo on the Pinti.——Leghorn has just received a new Protestant church, built by the Congregatione Olandese-Alemanna. It is Gothic in style, and will accommodate 400 sitters. The "Congregation" is an old one, being originally composed of German and Swiss merchants, who, in the year 1607, obtained a kind of charter of rights from Ferdinand of Medicis, then Grand Duke of Tuscany. For the first few years one chapel in the Church della Madonna was placed at their disposal; but this joint possession did not last long, and they built a small chapel, which, however, has long been too small for the increasing congregation. The Gustavus-Adolphus Society, and the Princess Marianne of the Netherlands, were the chief helpers in this new work, which cost 150,000 francs.——The City of Milan is about to erect a monument to Meyerbeer by public subscription. The amount collected at present is about 3,000 lire.——The Church of San Tommaso, at Almenno, is about to be restored by the authorities of Bergamo.

From *Vienna*, news comes that about a fortnight ago the last stone of a new and very large hospital, to be called the "Rudolf Stiftung," was laid by the Emperor in presence of the Empress, several grand-dukes, and a large assembly of the Austrian aristocracy. It is one of the largest institutions of the kind in this city, and presents three very imposing fronts. All modern appliances, sanitary and economical, have been introduced, and the arrangements for ventilating, heating, and lighting are said to be very perfect.——Two days later the Emperor was present at the ceremony of laying the last stone of the new buildings erected by the Horticultural Society of Vienna, which was first constituted in the year 1832. The first exhibition of flowers and fruit in Vienna took place in 1827. We learn this from the speech which the president of the Society made on the occasion.——The committee appointed to select a design for a Haydn monument, from a number which were submitted to them, have chosen that by Mr. Vincenz Pilz. The composer is represented seated, and in the act of composing. On three sides of the pedestal bas-reliefs are introduced, representing Creation, Symphony, and Harmony. The fourth side will bear an inscription. The genii of the Four Seasons appear at the corners of the pedestal, riding on swans, which emit water into a basin below. The judges were Professors Von Führich and Rahl; and Mr. Hansen, architect. The Society of Arts of this city have adopted the designs of Mr. August Weber for a new academy, which it proposes to erect. The buildings, which are on a large scale, will be commenced immediately.——The Imperial commission for exploring and restoring buildings of historical interest throughout the empire, have just ordered the restoration of the Castle of Meran, in the Tyrol. This was the cradle of the lords of Meran, and their territory fell to Austria when the last of the line, Margaret Maultasch, married an Austrian prince.

In *Munich*, the committee entrusted with the execution of a national monument to the late king, have decided on erecting it in the Maximilian Strasse, and invite public competition for designs. It is, however, limited to Bavarian artists only.——A very fine wooden pulpit has just been finished here under the direction of Mr. Marggraf, architect, for a chapel at Würzburg. It is 45 ft. high, including a pinnacled sounding-board, and is very elaborately carved with tracery, foliage, texts, and figures in niches.

From *Hamburg*, we learn that the magnificent church of St. Michael, built in the middle of the last century, and considered the *chef-d'œuvre* of the architect, Sonnin, has now been furnished with gas, the want of which has long been severely felt, as, from the immense size of the erection, it was found totally impracticable to light up the church in an adequate manner with candles or lamps. To cover the expense, a subscription was set on foot among the parishioners, to which, singularly enough, the poorer and middle classes subscribed with much greater liberality than the rich. But all the exertions of the indefatigable members of the committee voluntarily formed for collecting subscriptions were unavailing, and it was found that the contributions were not nearly sufficient to meet the expenses, which amounted to 9,000 marks. Notwithstanding this drawback, the committee resolved to proceed with the work, and it was successfully accomplished on their own responsibility. When finished, it was resolved to get up an oratorio in the church for the purpose of defraying the deficiency; and Miss Titiens, the eminent vocal *artiste*, who happened to be giving a set of operatic performances at the Hamburg Theatre, with her usual benevolence, volunteered to sing the principal part. The oratorio selected for the purpose was Handel's "Messiah," a great favourite with the Hamburg public, and it proved such a perfect success, that the sum wanted was more than covered. As the church in question is of a very peculiar construction, being built without side aisles, the difficulty of lighting it adequately was greater than usual, and it required much larger jets of gas to make the centre of the church light enough for reading. This is, however, satisfactorily done by 214 burners, which consume each from 5 to 7 cubic feet of gas per hour, according to their situation.

Getting now to *France*: some interesting discoveries have been recently made at Autun, where the remains of an ancient Gallic town have been found, at no great depth from the surface. It was the Bibracte of Cæsar's time, and was known in the last days of imperial Rome as Augustodunum: hence, doubtless, the present name, Autun. Amongst the localities and objects discovered are, parts of the old citadel, the foundations of about seventy houses—some round in plan, some square,—hollow brick walls, stone doors, ovens, pottery, amphoræ, nails, &c. The remains of a theatre, having a diameter of more than 150 ft., have also been opened up.——Bayard, "*sans peur et sans reproche*," is to have a monument on the ruins of his ancestral castle, near Grenoble. The emperor has forwarded a subscription of 1,000 francs to the committee.

In Paris, at the Buttes Chaumount, considerable works are being carried on for the construction of a new park, and two new boulevards partly bounding it, the total area of the whole being about 850 acres. The gypsum quarries of the Buttes Chaumont have been worked from time immemorial, and on a larger scale within these last few years, the greater portion of the produce being sent to America. It is a work of no ordinary difficulty to convert into a well-laid-out park a tract of land consisting of enormous elevations and depressions, presenting sudden differences of level, in some places as much as 70 ft. or 100 ft. But this is not the only difficulty: the nature of the soil, which consists of a few inches of vegetable mould immediately covering extensive beds of indurated marl, then beds of plastic clay, and the gypsum underneath, is another. The difficulty of making earthworks with plastic clay in bad weather; and the rapidity with which the marl decrepitates under the influence of the air, have rendered it impossible to make use of the ordinary means used in earthworks in Paris, such as the cart, wheelbarrow, &c.; so that the work is being done all by temporary rails and waggons. There are from 250 to 300 waggons now at work, 50 horses, and two locomotives. The latter are exclusively employed on the new boulevards, one of which has to traverse a knoll 270 yards long and 56 ft. at its highest point, over the roadway. This has been attacked by a heading driven through it, at the level of the boulevard, and into which the waggons are sent to be filled from enormous funnel-shaped holes overhead. There are in these works more than

ten cuttings opened, employing 600 men. In order to utilize as far as possible the rough character of the ground in embellishing the park, a great cavity left by one of the plaster quarries is to be converted into a lake, with an island towering to a height of 164 ft. above it. This island is to be joined to the park by an ornamental suspension-bridge, and is to be surmounted by a piece of architecture representing the temple of the Sybil at Tivoli. It certainly promises well.

On the Montluçon and Limoges Railway, lately opened, one of the principal structures worthy of note is the viaduct of La Cruse, 190 ft. high, and 371 yards long, in six spans of 164 ft. It is of iron, the superstructure being of lattice-work, similar to that of the Kehl Bridge over the Rhine, and resting on piers of wrought and cast iron open framework, supported on masonry bases. The originality of this construction consists in the piers having been raised by means of the girder itself. The whole beam, when completely put together at the side of the valley, was, as in the case of the Kehl Bridge, pushed over in one piece, not, however, on to the piers, but into space. When it arrived at the site of the first pier, the several tiers of the metal framework were dropped one by one from this cantilever upon the masonry foundations, and bolted together. This pier being terminated, the girder was advanced over to the site of the next, and so on till the beam reached the opposite side of the valley. The viaduct is expected to be completely finished in a few days. The whole of the work, this being the first iron viaduct in France, will cost under 1,500,000f. (60,000l.), including iron, timber, and masonry. This is at the rate of about 4,424f. per lineal mètre, or 161l. 15s. per yard run. The Fribourg Bridge, similarly constructed, cost 6,000f. per mètre, or 219l. 9s. per yard. The ironwork of the Creuse viaduct was constructed at Grenelle, in Paris, by the united companies of Parent, Shacken, & Co., and Cail & Co.——The town of Saintes (Charente inf.) proposes to raise a statue to Bernard Palissy; and a commission has been formed of the most celebrated local men of letters and artists, to carry out this patriotic and artistic design.

And so we might long go on noting evidences of activity abroad; but here for the present we stop for want of space.

SOMETHING ABOUT A HOD OF MORTAR.*

MORTAR, designated calcareous cement, or some such name, has been used for building purposes, by all civilised people, in all countries, during all ages. The palaces of Assyria, and those temples and pyramids along the Nile, of world-wide celebrity, which were raised long before the ages of historic certainty, and seem likely to reach the latest eras of mortal existence, are constructed with calcareous cement, as far as relates to bedding and jointing the stones.

Notwithstanding all these considerations, I venture to offer some remarks and experiments bearing upon this useful and valuable substance, for this reason,—that, as mortar is a very important material for forming a solid construction, it will bear describing in a variety of ways, in order that it may be well understood and make a lasting impression on the minds of the junior members of the profession. It is quite out of the question to suppose that an architect can be a sufficient judge of the quality of the numerous materials used in the construction of a large and elaborate edifice, especially if he should be so fortunate as to practise in the north, east, west, south, or midland counties of the British Isles, where the mineral substances of each neighbourhood may vary considerably, according to the geological formations of the district.

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The same specification of mortar for a London building might be unsuitable, perhaps almost impracticable, in a remote locality.

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The water of Tunbridge Wells is highly charged with iron. In Hertfordshire it contains a solution of chalk; at Harrowgate, sulphuretted hydrogen may be unmistakably smelt at all the springs; and salts are abundant in the waters of Epsom and Cheltenham. I believe none of these substances remain neutral when in contact with lime. They either improve or deteriorate the mortar, perhaps more than at first might be imagined, notwithstanding the high authority of Smeaton, who has stated that he could not discover any difference in the strength of mortar, whether it were made with sea or fresh water.*

Before attempting to improve a defective foundation by introducing a bed of concrete or cement of any kind, it may be as well to investigate the necessity for improvement—why one foundation should be considered solid, substantial, and satisfactory; another soft, yielding, and unfit to be trusted with a lofty ponderous erection. All mineral substances may be said to remain in their natural situations during very long periods, without undergoing any important change. They are always sufficiently moist, while undisturbed in the ground, to be beyond the influence of shrinkage by drying. Clay, in its natural state as we find it in the earth, is always, to a certain extent, laminated. If the strata are tolerably level, it forms a pretty good foundation; but if inclined to the horizon—that is to say, if the beds are much out of the level,—there is a tendency, especially during a wet season, for the beds, with their weight of buildings, to slide downwards, and thus cause disturbances in the superstructure. Compact earthy sediment, sand, gravel, chalk, and rocks of all kinds, almost invariably, have been originally formed at the bottom of the sea, or in the estuary of some large river, and afterwards left as dry land: the component parts of such terraqueous formations have been compressed into a tolerably solid state, under the influence of water and great superincumbent pressure. As a general rule, such undisturbed foundations are sufficiently solid and compact to bear any weight likely to be placed thereon by the skill and industry of the architect, engineer, or builder.†

All organic substances, whether of animal or vegetable produce, certainly undergo a somewhat rapid change when exposed to the atmospheric influences of air and moisture. During this fermentation and decompositisn a very large proportion of the soil is converted into gases, and gradually disappears in an aëriform state, leaving only a fraction of the original mass in a solid earthy condition, more or less, sooner or later, according to the amount of organic matter in the ground. While this decaying process is going on, however hard and compact the soil may be, it will certainly shrink into a smaller compass. For these reasons, we all agree that garden mould, and surface soil generally, must be removed before a building is commenced.

All attempts at improvement in human affairs must be based on natural laws. The mixture of lime and sand, to form a cement, is one of the combinations, amongst the prodigious number of nature's works, which we are in some degree enabled to understand and to imitate successfully. Every hard substance which we meet with in this world may be considered as a cement, because it presents evidence of having previously been in a fluid or soft state. Modern chemistry recognises nothing unchangeably solid, liquid, or aëriform. The hardest materials of which the colossal statues, obelisks, and fragments of Egyptian grandeur were executed several thousand years since, were at one time undoubtedly in a liquid or molten state; the same remarks will apply to the materials of the Parthenon at Athens, the Roman Colosseum, and the stone of St. Paul's Cathedral. Each separate material with which all these edifices are erected is unquestionably natural cement of a very durable quality, which the chemist or geologist can manage to analyse, and in some cases to understand; but with our present knowledge the most learned philosophers are not able to imitate, nor to compose, even approximately, a cement possessing similar qualities of hardness and durability.

Time is an important element in nature's operations. What is deficient in power is made up in *time*; and effects are produced during myriads of ages, by powers far too weak to give satisfactory results by any experiments which might be extended over perhaps half a century. In nature these changes proceed by slow degrees, and an apparently insignificant cause will produce a surprising effect if continued without interruption during periods of immense but unknown duration. Generally, in our hands, experiments are distinguished by suddenness of action; in nature, chemical power is distributed over a long period of time, and the process of change is scarcely to be observed. By art we concentrate chemical force, and expend it in producing a change which occupies but a few hours or days at most. Many of the more striking phenomena of nature are still mysterious to us, and principally because we cannot, or do not, take the element of time into our calculation. There is a prevalent impression on the minds of many persons, that the mortar used by our ancestors was far better than that which is used by modern builders: this, I am disposed to consider, is a great mistake; such lime and sand, mixed in due proportion, as is now generally used by respectable builders, will in due time become as hard and adhesive as any to be found in the edifices of former times; but time acts a most important part in the consolidation, and good calcareous cement will gradually increase in hardness, rapidly at first, but slower and slower, without interruption, as the centuries roll on, until it has attained a degree of induration equal to many varieties of real stone.

The various productions of nature offer evident proofs of her industry in all ages; changes have been going on, from the remotest antiquity to the present time, on every substance that comes within our observation. All the actual combinations of matter have had a former existence in some other state; nothing is to be found in nature but what is likely to change its present condition; the most solid and compact bodies have not such a degree of impenetrability and so close a union of the parts which compose them, as to be exempted from ultimate dissolution; they possess the materials of which they are composed only for a limited time, during which some powerful agent effects their decomposition and sets the elementary particles at liberty, once more to form other equally perfect combinations. In some bodies these changes are not so frequent and remarkable as in others, though equally certain at a more distant period. They seem to have their ages of maturity and decline the same as animals and vegetables, but whether this condition remain for only ten years or during ten thousand, is only a question of relative duration.

In thus alluding to cements generally, whether in a natural state, as rocks and stones, or produced artificially by man, they are all formed or governed by unerring physical laws. We may observe extraordinary influences, from the first appearance of force: in the adhesion of two atoms each solitary molecule is invested with peculiar properties and regulated by very surprising forces, which belong to the same class of substances; and although busy meddling man may interfere or create a disturbance amongst a few grains of sand, he has no power to alter or change their natural condition. Each atom is involved in its own atmosphere of properties or powers, which it obstinately retains. Considerable diversity is exhibited according to circumstances, but through all things the most perfect order and harmony are manifested. We may study the grand in what at first sight appears the simple, and learn in the mysteries of a particle of dust the divine truths which science has to relate of a planet.

The smallest grains of earthy or mineral matter, whatever may be their form or condition, are for ever under the operations of certain physical forces. One of the most important is called cohesion, or the attraction of aggregation, which is a power employed by nature in holding the particles of matter together; operating only on surfaces, or within distances too minute for the mathematician to measure or describe. Then we have caloric or heat, as a repellant force, in opposition to cohesion; so that each grain of matter, as well as the entire mass, is in a state of disturbance: from the centre to the surface all is in an active condition: a sort of mutation prevails with every created thing, and science clearly shows that influences are constantly in action which prevent the possibility of absolute repose. This law of nature exists amongst objects of microscopic dimensions, the same in principle as it is with those mighty spheres which the telescope reveals to us in the stellar universe,—that is, perpetual motion and alteration.

In the British isles and a large portion of Europe, calcareous rocks are very unequally distributed; in Ireland and Scotland they are rather scantily supplied, although there may be

* Amongst the unfinished papers left by the late Mr. C. H. Smith is the following, which was intended to be read, with illustrations and experiments, at one of the popular Institutions in the metropolis.

* "Eddystone Lighthouse," p. 105.

† Dry sand alone will take in a large quantity of water, without any increase of bulk; or, rather, with a remarkable decrease of bulk. It seems that wetting or lubricating the grains facilitates their sliding on each other, to fill the vacant spaces.

more than sufficient to supply the wants of animal and vegetable existences; but in England, limestone is superabundant, either as chalk, oolite, dolomite, or lias, especially in the south-eastern parts, extending towards the north-west as far as the counties situate between Yorkshire and Dorsetshire. The purest and most compact limestone may be defined as a transparent, colourless, solid substance; although it is generally quite opaque, of many different colours, various degrees of hardness, and not unfrequently adorned with an infinite variety of patterns: yet, notwithstanding they differ so much in appearance, the very materials that nature has applied to form such apparently opposite creations are almost identical; the whitest chalk and the blackest marble, the softest stones and the hardest spars, together with shells of the most beautiful colours and shapes, are all formed of very nearly the same elements, scarcely differing except in the manner in which they are developed, by containing a minute portion of colouring matter, or in the nature and extent of their duration when exposed to the weather.

Pure lime, or such as we usually obtain fresh from the lime-burner's kiln, is certainly never found in that condition in nature; it is invariably chemically combined with some other substance, generally with an acid, and most frequently with carbonic acid, forming chalk, Portland, Bath, and many other building stones; also most of the ornamental marbles. At every quarry, where limestone is obtained for building purposes, the greater portion of refuse material is regarded only as worthless rubbish. At the Isle of Portland, from whence all the Portland stone is procured for the principal buildings in London, there are at least 50,000 tons of excellent limestone chippings annually thrown into the sea, or buried in an old quarry, not being worth the trouble of carrying to a distance to convert into lime; whereas it would be valuable in Holland, and all those low countries where they have neither chalk nor any other calcareous earth. I am not prepared to say from whence the Netherlanders now obtain lime, but formerly their practice was to drag the shallow parts of the sea with nets, drawn by horses, for fish-shells, which they burnt for lime. In many islands of the southern hemisphere, the natives collect fragments of madrepores and other species of coral for the same purpose.

Notwithstanding these various substances differ so much in outward appearance, they all produce equally good lime, if sufficient care be taken in the calcination and preparation of them. Lias, and some others, may contain clay or iron in small quantities, which, when burnt, may improve the quality of cement for certain works. If a very soft stone be used for lime, such, for example, as common white chalk, it is liable to this disadvantage, that the cores or centres of the largest pieces, which probably have been only superficially burnt, remain of the same colour and in the same chalky condition after a certain amount of calcination as that which is burnt, and are thereby not taken notice of; and being equally soft, are easily broken into powder and mixed with the other ingredients,—consequently a weak and perishable mortar is produced. Whereas, if hard limestone such as lias, Portland stone, or black marble be used, the parts which are not sufficiently burnt or converted into lime, will still remain as hard lumps of the same black or brown colour, and must be rejected as "core," because they cannot be mixed with the well-burnt material: hence a far superior and more durable cement will be the result. So different may be the proportional quantities and chemical properties of apparently similar substances, that no rules or results, however definite, or however successful in one locality, can safely be trusted to in another. The precise mode of burning or manufacturing a newly discovered limestone for cement, must depend upon circumstances, experiments, and practice.

Although the before-named limestones may be considered to produce equally good lime in consequence of their containing very little foreign matter, there are many others which are not so well adapted to the use of the builder, or, more probably, not used because they cost a trifle more in preparation, as they take a longer time and a greater quantity of fuel in burning. Magnesian limestone is sometimes rather reddish, but usually is of a pale yellowish brown, and, without attentive inspection, may be mistaken for a fine-grained variety of sandstone. On analysis, however, it proves to be a compound of carbonate of lime and carbonate of magnesia, the relative proportions of which, though subject to considerable variation, may be stated at about three-fifths carbonate of lime and two-fifths carbonate of magnesia. If a piece of this stone be put into cold dilute nitric or hydrochloric acid, it will dissolve very slowly, with hardly any effervescence, although, in hot acid, the effervescence will be as vigorous as with common limestone. When burnt to lime it retains its causticity much longer than common lime does, and therefore no doubt modifies, to a certain degree, the properties of the mortar, into the composition of which it enters, although its precise action has hitherto been very little investigated. Those limestones which contain in their composition a certain proportion of iron and clay seem to be superior, in their consolidation and cementing properties when burnt into lime, to such as are purely calcareous. The iron and clay, when calcined, give the cement the property of becoming solid under water, and, therefore the cement is peculiarly valuable in subaqueous constructions. The gray chalk, which is obtained from the neighbourhood of Dorking, Merstham, and Halling, is of this description. It contains various proportions of ferruginous clay, from 6 or 8 up to 25 per cent., and after burning has a pale brownish yellow colour.

The most valuable variety of limestone for mortar, and especially for water cements, is the blue lias, which is generally of a dove colour when fresh broken; by long exposure to weather, it becomes brown on the surface. The lias formation is one of the most remarkable of the English strata: it passes obliquely through the entire country, from the sea-coast at Whitby to the cliffs at Lyme Regis, in Dorsetshire; there are also detached patches in the counties of Monmouth and Glamorgan. The quarries of Watchet, Aberthaw, and Barrow were celebrated for their excellent blue lias limestone long before it had been ascertained by experiment, and from geological surveys, that they produce similar substances on different parts of the same formation. By analysis, the blue lias of Watchet and Aberthaw contains about 11 or 12 per cent. of iron and clay; that of the Barrow about 14 or 15, or, according to Smeaton, 21·3 per cent. of the same ingredients. The lias limestone used by the London builders is brought from Lyme Regis.

Although lime and some hard granulated substance, such as sand, are the most important ingredients in all this class of cements, it seems to have been long and generally known to architects and builders, that if a certain quantity of oxide of iron and burnt clay be added, a vast improvement will be obtained in the cementing and hardening qualities of the mortar. Vitruvius and Pliny allude to the powder of Puteoli (*Pulvis puteolanus*), now known as puzzolana, a substance of a porous, rusty-coloured, half-concreted matter, a sort of natural brickdust, thrown out of Vesuvius during its eruptions; or, at any rate, it is clay, altered in some measure by volcanic agency, which, when reduced to powder and mixed with lime and sand, or with common mortar, has the property not only of attaining much greater induration by atmospheric influences, but also the valuable quality of hardening under water. This material seems to have been in great repute with architects and engineers during all ages, down to the present time; for I am informed that puzzolana, brought from the neighbourhood of Vesuvius, is now being used in the Government works at Portland; notwithstanding the same elements are found in the blue lias stone of Lyme Regis, which is within a few miles of that enormous work, the Portland Breakwater, now in progress. I have very carefully examined, analysed, and experimented upon these different substances, and cannot discover any elements or qualities in the volcanic product differing in an appreciable degree from ordinary brick-dust, or the argillaceous or ferruginous part of the blue lias formation. During the Augustan age, when chemistry and geology were neither known nor thought of, and in a country with probably only a trace of blue lias limestone, there would be great credit due to those architects or builders who discovered the improvement which puzzolana gave to their calcareous cements; but in our country, where, in numerous places, nature has furnished us with the same elements, mixed in the most suitable proportions, almost ready for use, I cannot comprehend why architects and engineers, in the middle of the nineteenth century, should send two or three thousand miles for that material which may be obtained, in every respect equally good and fit for their purpose, in many cases, within the very neighbourhood of the works they are about to undertake. If the practice of using puzzolana has nothing to recommend it more favourable than prejudice in favour of a material long in use, it must be important that the subject should be fully investigated, and forthwith made known to the profession.

Various opinions have long been entertained by chemists and others respecting the effect of sand and lime upon each other in the formation of calcareous cement. If the subject has ever been investigated, I am not aware that it has been made known to the public. The general impression is, that the slaked lime and sand in contact have a chemical affinity for each other; that the lime decomposes the surface of the sand, and the atoms or molecules interpenetrate each other, forming a sort of silicate of lime. This is an extremely ingenious theory, which has never been proved. The most powerful microscopic examination will display nothing in favour of such a hypothesis. In the year 1843 I commenced an experiment to determine whether any, and to what extent, chemical action proceeds between the lime and sand in ordinary mortar. For this purpose I selected from a heap of gravel a common flinty pebble of about 2 in. superficial area, such as when ground or broken into small fragments, would be considered as ordinary sand. I had it rubbed down to a flat surface, and polished as brilliantly as possible. The piece of flint was then ready for the lime, and to perform its part as a grain of sand. In procuring the lime for my experiment, it was important to be sure that it was of a fresh, pure, and genuine quality. I had long previously ascertained by experiments that the most perfect lime, or that which contains scarcely a trace of iron, clay, or other foreign matter, is to be obtained from the best kind of black marble, wherein the colour is merely carbonaceous matter, and is readily driven off in a gaseous state, during calcination. I was my own lime-burner, and from a fragment of the blackest marble obtained pure lime of the most inconceivable whiteness, which I slaked with water in the usual manner before it was quite cold, and made it into a paste sufficiently solid to be spread with a knife about the twentieth of an inch thick, on the polished surface of the flint. But, in order to observe more conspicuously the amount of change, if any, on the flint, I spread the lime only on one half of the polished part, leaving the other half wholly independent of the experiment. In this state I placed it on a projection of the wall of an open shed, where it lay protected from rain and snow, but freely exposed to all the usual atmospheric influences of damp and dry, summer and winter, during eleven years.

In March, 1854, at one of the Friday evening meetings of the Royal Institutions, in Albemarle-street, a small portion of the lime was scraped off, and no alteration whatever could be observed on the polished surface of the flint. At one of the meetings of the Institute of British Architects a few years since, a little more of the lime was removed, presenting the gloss as brilliant as ever; and now, after twenty years that this experiment has been tested, upon clearing off the remaining fragment of lime, there does not appear to be the slightest deterioration of polish: in fact, it would be impossible for the most scrutinizing eye to determine with certainty what part of the flint had been subjected to the influence of the lime.

In the construction of a wall, whether of brick or rough stone, it should be clearly understood that there is an important distinction between mere drying and the ultimate process of induration. The mortar may become sufficiently set, dry, and solid, in a few days or weeks, to enable the wall to bear a very considerable weight and pressure; but it does not acquire the maximum degree of hardness till after the lapse of many years, and even of centuries. The process of slaking quick-lime by throwing water upon it, causes a sudden chemical change, combining the two, thereby forming hydrate of lime.*

* Mix a certain quantity of water,—say a pound weight, with a pound of dry plaster of Paris; in less than an hour the mixture will have become a solid mass, although extremely damp. If this be gradually and thoroughly dried before a fire, or in a moderately-hot oven, until all the surplus water is evaporated, it will be found to weigh considerably more than the plaster did before it was wetted, or mixed with the water. This extra weight arises from the water being converted into one of its solid states, and is then called a "hydrate." The same process takes place in slaking lime; after which, the substance should be more correctly termed "hydrate of lime." For example, sprinkle, ¼ of a pound

After the hydrating is performed, the chief utility of all the water that is applied in mixing the mortar was to make the mortar in a state fit to be most conveniently applied to the building by the bricklayer. The water is also unquestionably useful in making the mortar, when dry, very porous, and thereby rendering it more susceptible of induration by atmospheric influences through the entire mass, and not merely on the surface.

One of the causes of the durability of old buildings, especially the ruins of abbeys and monasteries in the south-eastern counties, where chalk and flints abound, may be attributed to the long period during which the mortar has been exposed to the hardening influence exercised upon it by four, five, or six centuries. It is far beyond my attainments to explain the mode of procedure which nature employs in the induration of mortar. A chemist can tell to a certainty that mortar which has been used only a few weeks or months in a building, contains a large proportion of hydrate and a very small amount of carbonate in its composition; whereas, we now find the proportions are reversed in the mortar of old buildings; the greater their age the less hydrate and the more abundant is the carbonic acid, which is the material source of hardening. We know, by investigation and experiment, that such change has taken place, but we are rather ignorant of the time and ceremony which occur between two atoms while they are changing places; and science does not encourage the faintest idea that hydrate may ultimately, by some unknown process, be converted into or form a component part of the carbonate.*

of water upon 1½ pound of quick-lime; the lime will swell, become hot, and crumble into fine powder; when cold, it will be quite dry, and increased in weight about half a pound; the missing quarter of a pound of water having passed off as steam. Thus 2 pounds of slaked lime have been produced from 1½ pound of quick-lime. Quick-lime has two powerful and distinct affinities; first for water, and afterward for carbonic acid. On exposure, it absorbs moisture from the atmosphere, and is thus slaked into hydrate. If this be mixed with a larger quantity of water to about the consistence of cream, it will be in a state fit for whitewashing or limewhiting; and, when dry, after a day or two, it will no longer be hydrate of lime, but decidedly chalk, or carbonate of lime as it originally existed in its natural state.

* To be continued.

ENGRAVING AND OTHER REPRODUCTIVE ART PROCESSES.

To the antiquity of the art of engraving it is not my intention to do more than allude; it is abundantly evident that it was known to the Egyptians, and used long prior to the Christian period. The art was probably one which grew out of the necessity of attaching some distinguishing mark to individual works, or from the custom of recording the history of the early ages by cutting them in stone, many examples of which have been preserved to us. Soft bodies were also impressed with the makers' marks, as in the case of ancient bricks and other plastic bodies; and thus, what was in the first instance an isolated mark, led to and became a reproductive art. From a sculptured or monumental art a refined art grew up, of which, and the perfection to which it attained at an extremely early date, the engraved gems and seals preserved in our museums give ample evidence. Engraving on metal was early employed as a means of ornamenting articles of dress; and the coins preserved to us show how the skill of the die-sinker and engraver in metal became the basis of another reproductive art. Engraved metal plates have been found in the coffins of mummies, and are preserved in the British Museum. In India, engraving on plates of copper appears to have been practised long prior to the Christian period. It was there customary to ratify grants of land by deeds of transfer actually engraved on copper, and a copy of one of such relics, with an English translation, is given by Mr. Wilkins, in the 1st vol. of the "Asiatic Researches," page 123,—an early proof of the commercial use of engraving. To trace the history of engraving on stone and metal to the period when the art of printing was discovered, would only be to repeat an oft-told tale, and tend to prove that the one object which all appear to have had in view has been to facilitate the means of reproducing, at a cheaper rate and by a more ready means, copies of the works of the artist and engraver. It has appeared to me that the present is not an inopportune time for reviewing some of the changes which have been either introduced, or proposed for introduction, during the last half-century, and which have placed us in our present position with reference to the art of engraving, or its substitutes, for illustrative commercial art purposes. With a view, however, of making what I have to say more clear, it is necessary that I should state what were the peculiarities of the art processes in common use prior to the beginning of the present century. The earliest specimens of prints from engravings were those obtained from wood blocks on which the design was cut in relief, but the art of engraving on wood, though greatly improved, continued in an extremely imperfect state till within the last half-century. The perfection to which the art had attained in the year 1803, may be ascertained by a reference to vol. xxi. of the Transactions of the Society of Arts, in which is printed a specimen showing the great progress which the art had made at that date; and at page 13 of the Preface, we find the following:—"It has been frequently asserted that the art of engraving on wood is not, at the present day, equal to what has been done by some of the ancient masters, but when the emblematical performance of young Austin, in this line, prefixed to the present list of premiums, is considered as the work of so young an artist, it may probably appear that it cannot be excelled by many artists in Europe of a similar age, and the reward assigned is likely to excite his emulation to progressive improvements in that art." The reward given was the silver medal and ten guineas—and the block was for many years used by the Society as a specimen of the art, and was printed at the head of the secretary's letter announcing the election of new members. The art was, however, carried to considerable perfection by Bewick, who applied it in the illustration of his "Natural History of Beasts and Birds," and the commercial condition of wood engraving may be seen by a reference to that work. The earliest specimen of a print from a wood block is one known as the St. Christopher, and dated 1423.

The earliest use of engraved metal plates in England probably dates from the time of the Conquest; but Mr. Strutt states that he has not seen any with a date prior to 1284. They were then used as monumental brasses or tablets, and were executed with the graver, and are assumed to have been produced by ecclesiastics. The same principle which was applicable to the production of monumental brasses, viz., the removal of a portion of the surface of a metal plate by cutting it away, according to any desired design, by means of the graver, was applied by goldsmiths in the production of Niello work. The earliest known print from a metal plate, is one which can be seen at the Imperial Library, Paris; it is attributed to Tomaso Finegurra, the Florentine goldsmith, and bears date 1452; and the earliest known book illustrated in this way bears date 1478, and was printed at Rome. The next step in the improvement of the art of engraving is said to have taken place at the beginning of the sixteenth century, and is attributed to Albert Dürer, to whom is ascribed the invention of the art of etching, or drawing with a metal point or tracer, upon a metal plate, the surface of which was protected from the corrosive action of acid, by means of which the etching or drawing was permanently engraved in the metal plate. The process of etching afforded an opportunity of exercising any required amount of freedom of hand in the production of foliage or landscape, and soon led to a combination of the two processes, and was the means by which engraved copper-plates were usually produced at the beginning of the present century. This process is known as line engraving; it is a slow, tedious, and costly means of copying works of art; its peculiarity is, that it affords facility for giving a large amount of drawing and minuteness of detail, at the same time that it admits of the greatest possible gradation of light and shadow, and the most perfect artistic effect. The process of etching was largely used by Rembrandt. The most perfect works executed in the early days of this art are, however, to be found in the portraits and historical subjects, for the reproduction of which it was especially suited, though in later times it was largely and most effectively employed in the copying of architectural, monumental, and landscape art. Copper-plate engravings were printed in England, in "Vesalius's Anatomy," as early as 1545; but the English school of engraving cannot be said to have existed till about the middle of the eighteenth century, at which period efforts were made to advance the interests of artists in this country. It was during the reign of George III. that the Royal Academy was established; and as art advanced, so with its advancement grew up the use by our artists of the etching-point and the graver in a more refined and skilful manner. But the mere reproduction of copies of pictures from engraved plates printed in black inks, did not long continue to satisfy the public, and efforts were soon made to print in colours from the engraved plates; but no thoroughly satisfactory results were obtained from line engravings in this direction, and recourse was had to the next process, to which I shall call attention.

Line engravings were executed (as before stated) by cutting away the surface of the copper-plate by means of the graver, which, for this purpose was made concave in its length, and varied from a square to a thin V-shape in its width; thus enabling either a narrow or a broad line to be cut; while by a slight variation of pressure, or by depressing the hand of the operator, the point of the graver was gradually driven along the metal, or freed from the plate altogether.

Chalk or *stippled engraving*, the next process to which I have to refer, was, on the contrary, executed by means of a graver of an arched or convex form, and when applied to the surface of the copper-plate could not relieve itself from the surface of the metal, the whole tendency, wherever pressure was applied, being to thrust itself deeper and deeper into the metal, leaving a punctured dot, varying in breadth or delicacy according as the graver itself was more or less square or V-shaped on its face. This mode of puncturing the face of a metal-plate was known as "chalk engraving," from the clusters of dots being so arranged as to imitate the granulated effect of lines drawn upon cartridge paper with Italian chalk. This process was especially suited to portraiture, owing to the softness of its gradations from light to shadow, and the production of landscape effects, though admirably suited for copying the delicate effects of light and shadow, and giving precision of drawing, either to portraits or groups of statuary.

The *Mezzo-tinto* is a method of engraving the discovery of which is attributed to Prince Rupert; but on this I would refer to a letter by Dr. Diamond, which was communicated by him to the Society of Antiquaries in 1838, and to which is appended a catalogue of the earliest known works in mezzotinto. The catalogue will be found in vol. xxvii., pages 405 to 409, of the "Archæologia." I have before me, through the kindness of Dr. Diamond, a copy of a letter addressed by L. de Siegen to his Highness the Landgrave of Hesse-Cassel, and which I believe has never before been printed in this country, and appears to substantiate his claim to be recognised as the inventor of the mezzotinto art.

Dr. Diamond says in his letter:—

"In the last session I had the honour of laying before the Society of Antiquaries several remarkable specimens of early mezzotinto engraving; which prove beyond doubt that the generally received opinion as to Prince Rupert being the inventor of that style of engraving is erroneous. From the examples then exhibited, it appears that the person to whom the merit of the invention is due is Louis von Siegen (or *L. à Siegen*), a lieutenant-colonel in the service of the Landgrave of Hesse Cassel. The works of this amateur artist are of considerable rarity; and it is not improbable that they were merely distributed among his friends and patrons. Baron Heineken, in his 'Idée Générale d'une Collection complette d'Estampes,' printed at Leipsic, in 1771, says decidedly that Siegen was the inventor of mezzotinto engraving, and observes that the first specimen which appeared was the portrait of the Princess Amelia, Landgravine of Hesse; he adds, that Prince Rupert learnt the art from Siegen, and that eventually it became public."

"Huber, the compiler of Winckler's Catalogue, tells us that Theodore Caspar de Fürstenbergh, a Capitulary Canon of Mayence, was an engraver in mezzotinto; that his works are contemporary with those of Siegen; and expresses a doubt as to which was the disciple of the other; adding, if Fürstenbergh learnt the art of Siegen, he excelled his master. But there is no evidence whatever to warrant this doubt; on the contrary, the portrait of the Queen of Bohemia, which I exhibited in February last, bears the date of 1643, while the earliest known specimen of Fürstenbergh is dated 1656. It is only necessary to add that Rupert's earliest effort in mezzotinto (though etchings of this Prince are earlier, and one is known inscribed Rup. Pr. 1637) is of the year 1658."

The mezzotinto is a process altogether distinct from those previously mentioned, and was effected in the first place by puncturing or tearing up a uniform burr over the entire face of a copper plate, from which, if a print were taken, an impression in density of colour would be obtained equal to that required in the darkest parts of the picture to be copied. Upon this ground the subject to be engraved was traced, and by scraping and burnishing away the burr or dotted lines impressed in the face of the plate, either in part or wholly, the necessary gradations of light and shadow were obtained. This process, although affording facilities for

covering large surfaces, did not admit of being applied on a small scale, so as to give detail of drawing or delicacy of outline, and was in the main inapplicable to the production of foliage, and when first practised was grey in colour and flat in effect. At a later period, with the view of facilitating the operations of the engraver, an instrument called a roulet was invented, and was used for the purpose of impressing a series of dots into the metal.

The first person who applied the mezzotinto process on steel was Mr. T. Lupton, who, in 1822, submitted a specimen of his work to the Society of Arts, and stated that in order to obtain the necessary ground on the steel plate he had been obliged to lay his ways in eighty or ninety directions, whereas in preparing or breaking up the surface of a copper plate from twenty-four to forty ways were all that were required. The use of steel necessitated a much stronger hand and an increased number of ways in laying the ground, but the advantage of steel over copper was that from eight to ten times the number of prints could be taken.

Aqua tinta, a process of engraving which was extensively used at the beginning of the present century, but which is now rarely employed, was executed by a process of the following description:—The surface of the plate of metal to be engraved was equally covered with a finely-powdered resin. The plate was then warmed, to attach the grains to the surface of the metal. A tracing of the design to be engraved was laid upon the resin, and the surface of the plate, after the whites had been stopped out, was submitted to the corroding action of acid, which, acting between the grains of resin, produced a grain in the face of the metal plate. The light parts of the design were next stopped out, when the acid corrosion had been carried far enough. The darker parts of the design were again submitted to the action of acid, and this process was repeated till all the gradations from light to shadows, required by the design, were produced in the metal. A slight amount of burnishing and scraping of the plate so bitten in was then resorted to, to blend the several parts of the picture, and to heighten the lights where necessary. This process was carried to great perfection by Mr. Sandy, about 1799. Such were the various processes in general use at the beginning of the present century, the whole being originally executed in copper. A growing demand for book illustrations, and a necessity for prodncing the engraving in a more durable metal, and one that would consequently yield a greater number of impressions, led to the introduction of the next process.

Steel Engraving.—The invention of steel engraving is due to Mr. Perkins, who first introduced the art in America; his object being to increase the facility, cheapen the cost, and produce absolute identity in the manufacture of bank-notes. In order to effect this, he etched or engraved a steel plate, or, more properly, a block of soft steel, by the ordinary process of line engraving. The plate, or block, was then hardened. A cylinder of very soft steel, of from 2 in. to 3 in. in diameter, was then rolled backwards and forwards under pressure on the surface of the steel plate, until an impression from the engraving was obtained in alto-relievo on the face of the cylinder. The cylinder so obtained was in its turn case-hardened; and by rolling the hardened die over the surface of a flat plate of copper or soft steel, an exact copy of the original engraved plate, with all its sharpness, was secured. This process being repeated, any desired number of plates could be obtained from the die. As the object first sought was the production of bank-notes, and the cost of elaborate designs was great, a machine was invented in America by Mr. Asa Spencer, which was called a geometric lathe, and this was employed in the production of geometrical figures in combination with line engravings, as borders and ornaments on the face and back of notes. Mr. Perkins brought his invention to this country, where it was introduced and known as the "sederographic" process for multiplying copies of engravings. Soon after his arrival in this country he was joined in working his process by Mr. Heath; and they state, in 1821, "we cannot yet say how long a well-hardened steel plate will last, having never printed more than 500,000 impressions from the same plate. It should, however, be observed that this plate consisted principally of writing, or work quite as strong. It may also be observed that the impressions are yet good." The first steel-plate engraved in this country is attributed to Mr. Raimbach, who was soon afterwards followed by the chairman of the Fine Arts Committee of the Society of Arts, Mr. Charles Warren. Engraving on steel, beyond necessitating a change in the nature of the acids used, and a better and more perfect graver, involved but little alteration in the process of engraving itself. Steel-plates admitted of an increased commercial product, in the form of prints; but they also demanded more time in their execution, and, as a consequence, a higher rate of remuneration for their production; and thence arose a class of men whose works as artists gave fashion to the art of engraving and book illustration; and out of their labours came such works as "The Forget-me-not," "The Keepsake," "The Book of Beauties," &c., &c., coupled with which works are the names of the Findons, Charles Heath, Rolls, Lacy, the Le Keuxs, Goodall, Willmore, Doo, and others, a school of engravers which has now entirely passed away. With the extended use of steel, however, came a proportionately heavy charge for printing, which, where large numbers were required, it was desirable to reduce as far as possible. This charge was not material as affecting high-priced works; but I have said that it gave rise to a fashion in book illustration, and a readier and cheaper means of illustration was demanded. We accordingly find that "Hone's Every-day Book," and "The Penny Magazine," which were popular works, and amongst the earliest examples of cheap literature, were illustrated with wood-engravings, which, being produced in relief, and capable of being printed with the type, saved the ordinary extra charge due to printing from steel plates. But, however artistic and effective wood-blocks were, they lacked the refinement of the steel engraving.

Concurrently with this spread of art in England, came the opening of the American, and the creation of an Australian market for English literature; and the adoption of a German discovery, which has done more to revolutionise art in this country than any other previously introduced, viz., the invention of lithography by Alois Senefelder, who, about 1795, while in search for a cheap means of printing the pieces which as a dramatist he produced, by an accident discovered that, by writing on a slab of Kelheim stone with ink prepared with wax, soap, and lamp-black, and then biting in the stone with *aqua-fortis*, a surface in relief could be obtained, from which prints could be taken in the same way as from wood-engraving. This discovery led to the art of lithography as now practised. To the growth of the lithographic art I shall return hereafter; but for the present I would merely say that its introduction and the great cost, as well as the time involved in printing from steel or copper plates, led to numerous attempts to cheapen the cost of engraved plates, and also to multiply the plates when produced. The process introduced by Mr. Perkins was inapplicable to a large surface, both on account of cost and the difficulty and risk of injury in applying it. But machinery had been applied in the form of the geometric lathe, and a desire was created to possess a machine of a simpler character which might be employed to produce skies and backgrounds to portraits, without involving the skilled, and in many cases monotonous, labour of etching. This want was soon supplied by Mr. Lowry, who was speedily followed by Mr. Porter, Mr. Taylor, Mr. Storker, and others. By the first-named a machine was invented for ruling either straight or waved lines, which, when used separately, produced flat or graduated tints, and when used in combination produced the effect now so generally seen on the face of bankers' cheques. . . . . .

The result of these machine processes, coupled with the introduction of lithography, was to create serious competitors with the aquatint and mezzotint processes; which may be said to have been swept away by the great advance which lithography has made, and to the consideration of which we will now return. I have stated that Senefelder discovered, about the year 1795, the principle upon which lithography is based, but it was not till 1819 that much progress was made in the art; but at that date, owing to the fostering care of Baron Aretin, in Munich; Count Lasterie, in Paris; and Mr. Rudolph Ackerman, in London, an account of the art of lithography, showing its then state, appeared. The establishment of the art of lithography in England is, however, due to Mr. Hullmandel, who not only drew upon stone with crayons and printed from them in black ink, but soon carried out the process by drawing on two or three stones, and printed from them with ink of a neutral tint; he also drew on several stones, and printed from them in colours. Mr. Hullmandel introduced the process known as litho-tint, the drawing being made upon the stone with a brush and liquid ink, and he also applied the process of stump drawing. The facilities which drawing with the crayon, the stump, and the brush, afforded for the production readily, and at a moderate cost, of a surface from which to print, soon gained for the art a large amount of public support, and enlisted the sympathies of the late Mr. Mulready, Mr. J. D. Harding, Mr. Louis Haghe, Mr. James Ward, Mr. J. Lane, and other Royal Academicians and artists, who applied themselves to the production of sketches on stone. There was, however, in the early attempts at lithography, a crudeness of effect and a want of gradation from light to shadow. To overcome this, Mr. Hullmandel made a material between ink and chalk, which, being applied to the hard edges, carried the full tints by gradation into the high lights. The effect thus obtained advanced the art in the estimation of artists, as it increased the facility for producing artistic effects, which was greatly helped by the use of tinted paper and printing in neutral tints from several stones. Printing in colours was practised by Senefelder, but his early specimens give but a faint idea of the richness and beauty of the productions of Mr. Owen Jones, who applied himself to develope the powers of lithography, and who not only drew upon stone, but also printed in gold and colours the entire of his work illustrative of the Palace of the Alhambra. In addition to drawing on stone and printing in flat colours, Mr. Jones introduced a method of printing from graduated tints drawn in ink only upon the stone, graduating his tints by stippling upon polished stones with a fine camel-hair pencil.

Litho-tinto is a method of drawing, in which washes of ink are applied to the surface of the stone; but it is not largely in use, though many artists have employed the process in the reproduction of their own sketches. The process of stump drawing, by Mr. Hullmandel, afforded great facilities for the production of even and graduated tints over the stone, and soon became a process in general use. The cost and inconvenient weight of the lithographic stone led to a desire to find a substitute, and for a large amount of commercial work, drawing on zinc has been found to answer, and is now extensively in use. This fact leads me now to refer to the commercial, rather than the artistic use of lithography.*

S. T. DAVENPORT.

POST-OFFICE STATISTICS.

THE tenth annual report of the Postmaster General (for 1863) has been issued. It differs from previous reports; reviewing progress during the last ten years, as well as during 1863. It also shows, on the whole, that the correspondence of the country has risen from about 70,000,000 of letters in 1839,—the year before the penny-post system was introduced,—to upwards of 640,000,000 in 1863.

The total number of letters delivered, in 1854, throughout the three kingdoms, at 4,847,983 inhabited houses, to 27,967,565 persons, was 443,649,301, or at the rate of 15 to each person. The total number delivered in 1863, at 5,242,723 inhabited houses, to 29,335,318 persons, was 642,324,618, or at the rate of 22 to each person. Thus the increase in 1863 over 1854 was 198,675,317 letters, delivered to 1,367,753 persons, at 394,740 inhabited houses, or at the rate of 7 to each person. The increase in England and Wales alone was from 358,300,696 letters, to 529,325,485, or 171,024,789, delivered at 421,739 inhabited houses (or at an increase of houses from 3,440,442 to 3,862,181) to 1,921,482 persons (or to an increase of persons from 18,711,016 to 20,632,498); being an average increase of 7 letters to each person (or from 19 to 26). The increase in London alone was from 103,000,000 letters to 161,000,000, or 58,000,000, delivered at 62,838 inhabited houses (or an increase of houses from 382,949 to 445,787), to 484,982 persons (or to an increase of persons from 2,831,950 to 3,316,932); being an average increase of 12 letters to each person (or from 36 to 48). The increase in Scotland alone was from 44,114,009 letters to 61,401,678, or 17,287,669, delivered at 20,701 inhabited houses (or at an increase of houses from 377,208 to 397,909), to 155,329

* To be continued.

persons (or to an increase of persons from 2,940,516 to 3,095,845); being an average increase of 5 letters to each person (or from 15 to 20). The increase in Ireland alone was from 41,234,596 letters to 51,597,455, or 10,362,859, delivered at 47,700 inhabited houses (or at a *decrease* of inhabited houses from 1,030,333 to 982,633), to 709,058 persons (or to a *decrease* of persons from 6,316,033 to 5,606,975); being an average increase of 2 letters to each person (or from 7 to 9).

The foreign and colonial letters coming into the United Kingdom for delivery are about one-fiftieth of the whole number of letters delivered; and the letters despatched to foreign countries and colonies are nearly equal in number to those which are received. The most remarkable increase is in the case of France. In 1854, before the reduction of postage thither, the correspondence amounted only to 3,000,000 letters: in 1857 it was 4,200,000; and in 1863 it had reached 6,373,000.

It is believed that 15 per cent. of the total number of letters posted in London contained printed enclosures, mostly advertisements. During 1863 an account was taken in London of 3,957,000 letters which were obviously circulars, and of which 3,485,000 could be assigned to various trades and societies in the proportions shown in an accompanying table. The number of letters recorded as circulars, however, is much below the actual number of them posted in London, as circulars which are posted in small quantities escaped notice. Of the number above recorded, 1,690,052 were from drapers; and in 1859, 400,000 circulars with regard to the projected Handel Festival were despatched in one day to the Post-office, in two vans, which they filled.

The tables show that there has been a marked proportionate increase of facilities for posting letters within a convenient distance from the homes or places of business of the writers. This great extension of accommodation has been effected mainly by the introduction of pillar and wall letter-boxes, which first came into use in 1855, and now form nearly one-third of the whole number of receptacles for letters. Throughout the country these receptacles have been increased at the rate of 52 per cent. since 1854, while the number of inhabited houses has only increased at the rate of 8 per cent. In 1854 the London district had only one receptacle for letters to every 813 houses, but in 1863 it had one to every 426 houses. Perhaps the chief if not the only objection to the pillar and wall receptacles (unless letters be occasionally longer in these than in the post-offices before delivery), is that the public are not sufficiently warned not to put bock packets into them, as these are often tediously detained, and sometimes are altogether lost.

There are one or two other points in connexion with the Post-office regulations to which we may here refer, as being worthy of the attention of the authorities as well as of the public, who ought to be more fully informed as to them either by means of advertisement in the most widely-circulated newspapers, or by sending to the journals, in both town and country, paragraphs, which, in nine cases out of ten, the editors of newspapers, in their wish to do good, would gladly insert. But even if it were needful, for the right publication of the most important of the Post-office regulations, that advertising should be resorted to, extra expense should not be a consideration; for the Post-office should rather be considered as a public convenience than as a source of revenue. Sir Rowland Hill's system is amongst the wonders of the age, but the very thankfulness which we feel for it causes a wish to make all the arrangements as complete as possible.

One of the matters to which we would desire to draw attention presses hardly upon the industrious and poorer classes. We refer to the passing of coin in letters through the Post-office. It is well known that this practice has been the cause of dishonesty amongst the letter-sorters and carriers; and it is most desirable that the practice, now that a Post-office order can be obtained for 3d. for any sum less than 2*l*., should be put an end to. The difficulty, however, is, that in consequence of the want of a more extended publicity, there are thousands of those very persons upon whom the rule presses very hardly who know nothing about it. It has been usual for poor people to send to friends at a distance very small sums of money: sometimes these remittances, which are most valuable in time of need to those to whom they are addressed, consist of 1s., 1s. 6d., or even less, and those who know the condition of these people are aware that the receipt of even a very small sum is sometimes a matter of life or death. Now the regulation of the Post-office is, that if any coin can be felt to be enclosed in a letter it is registered at the Post-office. The charge for registering such a letter is 4d.; but in consequence of the person posting the letter containing money not having paid this sum, 8d., or double the amount, is charged to the person receiving it. In many ways this regulation presses severely, and on those, too (the receivers of the money), who are not blameable in any way. In many cases, the person to whom a letter of this kind is sent has not 8d. to pay for it; often there is no right address of the sender forwarded; and there can be no doubt that a large amount, consisting of small sums, is thus added to the profits of the Post-office. We could mention many instances that have come to our own notice of the way in which this regulation works. A mother, whose little girl was in an hospital, sent her 6d. in a letter: the porter of the establishment paid 8d. for it; so that the child, instead of receiving any money, was left 2d. in debt! A woman on the brink of starvation had a shilling sent to her by a friend. With the greatest difficulty she managed to raise the 8d. requisite; and after this was paid of course her shilling was reduced to 4d. We could give many other instances, but these will suffice to show our meaning.

We do not complain of the attempt which has been made to stop the transmission of coin through the post-office; but the way in which the present regulation works should be more extensively made known. It is not those who send bank-notes and other valuables, to a large amount, who feel the pinch; but the poorer people, to whom every 8d. is of serious account; and these should be instructed that a post-office order can be got for 3d. But then people say, why pay this for the transmission of a small sum? Why not 2d. for 10s., and 1d. for 5s.? A letter containing coin can be registered for 4d.; or a very small amount may with *perhaps* less risk be sent in postage-stamps, which may, if necessary, be exchanged at the post-offices at a charge of 3d. for 10s. worth.

Nor has the registration system served to diminish the evil of pilfering which it was mainly established to prevent. True, "the number of registered letters has risen from 1,457,000 in 1860, to 1,965,000 in 1863; and the number of applications for missing letters containing *coin* has fallen from about 6,000 to about 2,000 per annum;" but, "on the other hand, the good effect of these measures has to a great extent been neutralized by the growth of the practice of transmitting postage-stamps through the post; the applications for missing letters containing postage-stamps having risen precisely in the proportion in which the applications for missing letters containing coin have fallen."

As regards the transmission of little matters through the post to our soldiers and sailors who are serving their country at foreign stations, there seems to be the same want of information as that to which we have alluded. Many who have sons and dear friends in India and other distant lands send little articles in the shape of keepsakes; and the rule is that for any letter or package under the weight of half-an-ounce sent to India or any of the English colonies, the postage is 1d.; but if a fraction over this weight, the charge is *one shilling!* And if in ignorance any one post a letter without the payment of this sum, and it gets to its destination, double the charge of the postage is made. A case has been mentioned to us of a woman who has a brother on board H.M.'s ship *Zebra*, which is stationed on the west coast of Africa, engaged in the prevention of the slave trade. She sent several letters inclosing little articles. The postage was paid for at the rate which would be charged, in proportion to the weight, for sending to any part of Great Britain; but, after the lapse of a long time, it was found that they did not get into the sailor's hands at all: and, on inquiry, it was found that they were detained at Sierra Leone, in consequence of the postage not being sufficient. Such matters require to be seen about; and many think that in the present management, since the retirement of Sir Rowland Hill, the authorities of the Post-office are drawing the reins rather too tightly; and, in their anxiety to increase the revenue, are not showing the same kindly disposition that was formerly shown to serve the public.

The number of money-order offices in the three kingdoms has been increased from 1,872 to 3,005 since 1854; the amount issued from 10,462,411*l*. to 16,493,793*l*. The increase for England alone has been from 1,221 to 2,150 offices, and from 8,957,136*l*. to 14,087,883*l*. in issues. For Scotland the increase has been from 273 to 352 offices, and from 814,446*l*. to 1,305,871*l*. in issues. For Ireland it has been from 378 to 503 offices, and from 690,809*l*. to 1,100,039*l*. in issues. The increase in London has been from 96 to 373 offices, and from 1,798,955*l*. to 3,181,874*l*. in money-orders issued.

The Post-office savings-banks returns show that on the 31st March, 1864, there were in the three kingdoms 3,024 banks, 372,955 depositors, and 4,097,492*l*. due to them. The total number of depositors in the old savings-banks prior to the establishment of the Post-office banks was 1,609,103; and the increase in the number of savings-bank depositors since the establishment of the Post-office banks has been 278,407. In Scotland there were on the 31st of March last 354 post-office banks, 18,683 depositors, and 107,932*l*. due to them. In Ireland there were 510 banks, 14,639 depositors, and 160,756*l*. due to them. The number of banks in London was 374, the number of depositors 117,955, and the money due to them 1,143,337*l*. The number of savings-bank depositors in London previously to the establishment of the Post-office banks was 332,798, and the increase since has been 89,874.

The report congratulates the country on the fact that "by the establishment of Post-office savings-banks the Legislature has effected not a mere transfer of depositors from one establishment to another, but a real and considerable increase in the total number of saving persons throughout the kingdom." In the London districts there is one depositor (taking the depositors in old banks and those in Post-office banks together) for every seven persons; and in the 106 postal districts of England and Wales, which are specified in the tables, there is one for every thirteen persons: in the rest of England and Wales, one for every fifteen persons; in Scotland, one for every seventeen persons; and in Ireland, one for every sixty-eight persons.

The effective force of officials connected with the Post-office throughout the country in 1854 was 21,574; and in 1863 it was 25,492. The total cost of the service was 2,312,681*l*. in 1854, and 2,956,486*l*. in 1863. To meet this the gross revenue in 1854 was 2,619,786*l*., and in 1863 3,730,073*l*. Thus the net revenue in 1854 was 389,181*l*., and in 1863 it was 1,042,969*l*., remaining, of course, after deduction of the total cost of the service.

France, we may here remark before concluding, is to be divided into six postal districts, the centres of direction being Arras, Alençon, Toulouse, Poitiers, Lyon, and Nancy.

COMPETITIONS.

Metropolitan Meat and Poultry Market.—Though two premiums were offered for the first and second best designs, viz., 300*l*. and 200*l*., only seven sets of drawings have been sent in, and three of these are incomplete works. This result is due to the supposed intention of the Corporation not to employ the author of the selected design to carry it into execution. The designs are marked as follows:—No. 1. "A Key." Estimated cost, 100,000*l*. No. 2. "For the use of the Citizen, and the Decoration of the City." 150,000*l*. No. 3. "Citizen Stationer." 122,000*l*. No. 4. "*Semper Paratus.*" 75,000*l*. No. 5. "*Invicta.*" 90,000*l*. No. 6. "*Fortuna Sequatur.*" No estimate. No. 7. "*Spero.*" 20,100*l*.

Hospital, Wimbledon.—The governors of St. George's Hospital, desiring designs for the hospital about to be built at Wimbledon in connexion with their institution, invited plans in competition from Mr. Hakewill, Mr. Mee, Mr. T. H. Wyatt, and Mr. M. D. Wyatt. The design by the last-named architect was selected, and will be carried out by the Messrs. Wyatt conjointly.

Bath Forum House.—Under this title a hotel and bathing establishment are to be erected in Bath. Designs being sought for, twelve were sent in by nine architects. From these four have been selected for further consideration, all the work of architects resident in Bath. The architects whose designs are selected are,—Mr. C. E. Davis, city architect; Messrs. Giles, Hicks, & Isaacs, Mr. C. J. Phipps, and Messrs. Jas. Wilson & Wilcox. The instructions with which each competitor was furnished, before preparing his plans, specify that the form of the building shall be

"a centre, with two wings enclosing a quadrangle, the whole to front towards Stall-street, which must be increased in width as much as 10 ft." A Gothic design was forbidden, because it would not harmonize with other architectural features of the city, and the cost was not to exceed 15,000*l.*, exclusive of pipes and extra fittings, heating apparatus of the baths, &c. All the designs are, therefore, in the Italian and Classic styles. The cost of, at any rate, two of the designs would probably exceed the stipulated amount considerably. Since this was written the first premium (200*l.*) has been awarded to Mr. C. E. Davis; the second (100*l.*) to Messrs. Wilson & Wilcox.

The Tatton Sykes Memorial.—A design submitted by Mr. John Gibbs, architect, Oxford, has been selected.

Medal for the South London Industrial Exhibition.—In reply to the offer of 5*l.* for the best design for prize medal proposed to be awarded to meritorious productions at the close of the forthcoming exhibition, twenty-one designs were sent in by twenty-one competitors. The judges selected four in the following order:—1. The design marked "*Nisi Dominum frustra.*" 2. The design marked "Fleur-de-lys." 3. The design marked "The Talents." And 4, the design marked "Conatus." The committee then proceeded to break the seals of the envelopes containing the names of the artists, and it was found that the successful competitor was Mr. R. Wallace Martin, sculptor's carver, of No. 5, John's-terrace, Olney-street, Walworth. To him, therefore, the prize of 5*l.* was awarded. The design for which the prize has been given is modelled in brown cement. On the reverse is a figure of Fame holding a laurel wreath in each hand; beneath which on either side are figures of men—on the right an architect seated upon a Corinthian capital, surrounded by architectural specimens, and engaged in preparing a design; on the left, the figure of a mechanic leaning against a horizontal steam-engine, and intently studying an open book. On the obverse are inscribed the names of some fifteen or twenty men who by labour have risen to eminence.

Pembroke Dock Congregational Chapel.—The committee have chosen the design submitted by Mr. R. C. Sutton, Bromley House, Nottingham.

New Wesleyan Chapel, Belfast.—The committee appointed by the Wesleyan conference to make arrangements for this building, having invited the following architects to submit designs in competition, viz.—Messrs. Lanyon, Lynn, & Lanyon, Belfast; Mr. Alfred G. Jones, Dublin; Mr. William Fogerty, Dublin; and Mr. William Hill, Leeds; after careful consideration have selected the design of Mr. Fogerty as best suited to the requirements. The Institution is to consist of two departments, one academical and the other collegiate, with accommodation for professors, students, and boys, on an extensive scale. The selected design is in the Gothic style, with red brick facings and stone dressings. The immediate outlay proposed is 10,000*l.*, with provision for future extension. The committee very honourably voted the sum of 40*l.* to each of the unsuccessful competitors.

Burnley Market.—Sir: I enclose you particulars of the Burnley Market Company (Limited), and I have underlined the *per centage* part of the business.

It now appears to me a fact, that there are architects who will work for 2½ per cent., and furnish all detail drawings, elevations, plans, &c. &c. As for the 10*l.* premium, it merges into the commission, and thus the Company will doubtless have forty or fifty sets of designs to select from, and for the low charge of 2½ per cent. get all they need except superintendence. Again, if the Company think (supposing them to be competent to judge) the designs of not sufficient merit, they will not give the premiums.

Now, sir, let us take notice who will send in for this affair; there will be no difficulty in getting the competitors' names, and then they ought to be made public.

I quite concur in all "J. B." states in your recent number, and I think, as we are now beginning a new year, it would not be amiss to try and find out how many architects would send in their names to you as willing to support the proper professional charge of 5*l.* per cent. and abide by it.—ONE OF THE CRAFT.

BOLTON TOWN-HALL COMPETITION.

OUT of the thirty-eight designs submitted, Professor Donaldson, to whom they were referred, selected for special consideration, six, marked as follows:—24, "*Experientia docet;*" 3, "Manchester;" 25, "*Nil Magnum nisi Bonum;*" 19, "Do you like it?" 26, "*Utile dulci;*" and 10, "*Experiar.*" These are in the order as the referee considers of their respective merits, 24, 3, and 25 being recommended for the premiums, 120*l.*, 80*l.*, and 40*l.* In his report, Professor Donaldson says:—

"I have been met at the outset with this great difficulty, that hardly any, if any, of the designs contain the full number of rooms and accommodation of the sizes therein specified. But as there are the words appended 'or as near as may be,' I have felt that there was a latitude left to the discretion of the competitors, which put it out of the question to reject any on account of nonconformity, and that it must depend on the judgment of the committee, who are left free to decide as to any omissions in that respect, the consequence of which would rest solely with the competitors themselves. Were this not the case, and if I were limited in my selection to those projects which strictly adhered to the instructions, I might have had to omit many, which, for general convenience in the arrangement of the plans, or for beauty in the treatment of the elevations and decorative architecture, are most worthy of your attention, and alone suitable to the occasion. Mere technical conformity to the instructions is not what you require; but a masterly grasp and comprehensive treatment of the whole subject. At the same time I have considered it necessary to note where the designs, which I have the honour to submit to your consideration, conform more or less to the requirements stated, and I leave it for you to decide how far the deviations should weigh in affecting your judgment, when making your ultimate selection for the three prizes."

"If the committee should be pleased to confirm my opinion of the relative merits of the designs, I venture to suggest whether a combination of the plans of No. 24 or 3 with the elevation of No. 25 might not be advisable, so as to produce the most convenient and effective design, and thus most successfully carry out the expectations of the town council, producing a monument that shall as a whole reflect credit on the borough throughout all times. I must venture to impress upon the committee the necessity of having a lofty clock tower as an *essential part* of the design."

He suggests to the corporation that they should not expect that the total outlay for the structure, including a tower, and exclusive of site, will be less than from 70,000*l.* to 80,000*l.*

We are glad to see the *Bolton Guardian* protesting in strong language against allowing the selected design, whatever it may be, to be carried out by any other than the architect who produced it. The writer properly says:—

"Feeling, as we do, a deep interest in the Town Hall scheme, we are anxious that both in relation to its cost and adaptation to public business, as well as its architectural finish, it should reflect the good sense, the taste, the liberality, the honour of our municipality, and be in all respects in keeping with the rising character of the borough."

We understand that the recipient of the first premium is Mr. Hill, architect, Leeds; of the third, Mr. Cuthbert Brodrick, also of Leeds. The award of the second premium has not yet reached us.

THE LATE MR. JOHN DOBSON, OF NEWCASTLE, ARCHITECT.

WE record with very great regret the unexpected death of Mr. John Dobson, of Newcastle, which took place on Sunday last, in the 78th year of his age. Bronchitis was the fatal complaint, and carried him off suddenly, although he had long been ailing. Mr. Dobson was born at Chirton, near North Shields, on the 9th December, 1787. His father had the discrimination to perceive that his son was gifted with rare talent, and gave him what in those days was considered a good education.

At the period of Mr. Dobson's youth, architects were not so plentiful as they are now, nor was the distinction between design and construction so well defined. Mr. David Stephenson was the only architect in Newcastle, and he was a builder as well as an architect. To him Mr. Dobson was sent as a pupil, and he soon exhibited signs of aptitude in the acquisition of his profession. While with Mr. Stephenson he found in the person of an Italian refugee named Muss, a master capable of imparting to him valuable instruction. He studied perspective with him, and had for fellow pupil John Martin. He afterwards studied under John Varley, at that time one of the most distinguished artists of the day.

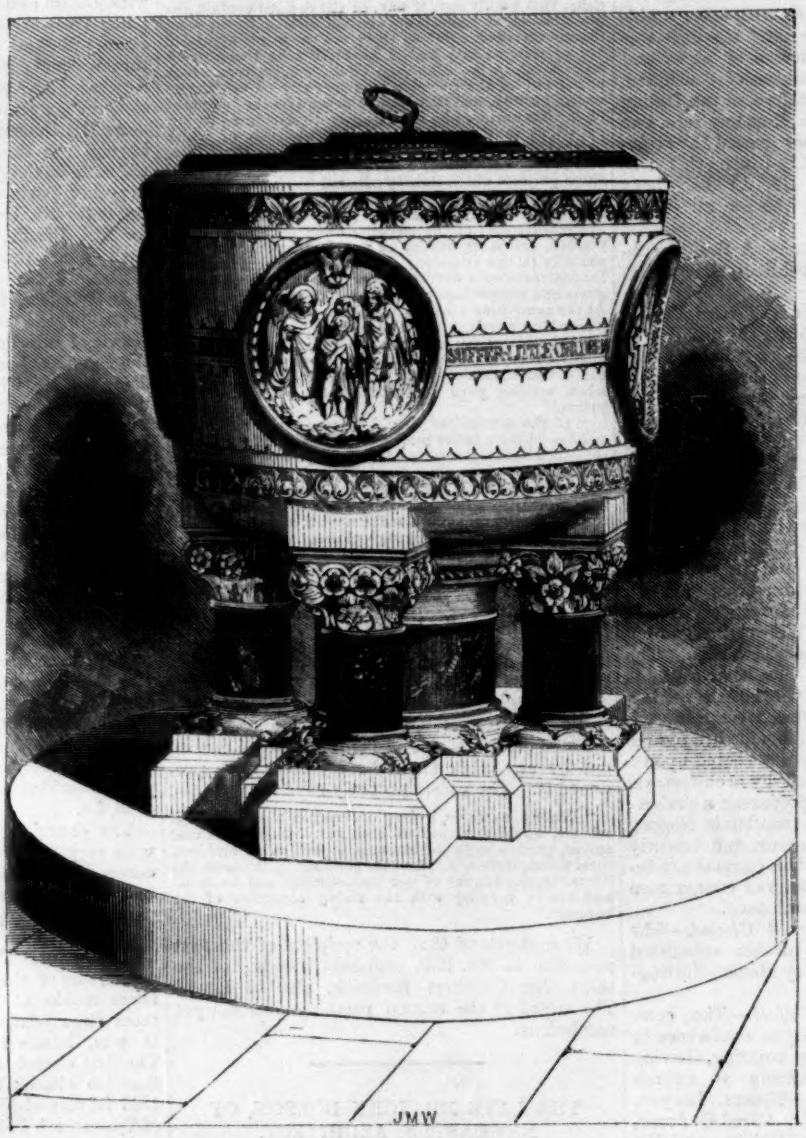
When Mr. Dobson returned to Newcastle he found that he was the only architect in the county of Northumberland, as Mr. Bonomi was the only architect in the county of Durham. He received some commissions, and in the intervals of his employment he travelled in England and France, studying church architecture. He soon got well to work. Chipchase Castle and Haughton Castle, both on the North Tyne, were improved by him, and the pile designed by Sir John Vanbrugh for Sir Ralph Delaval, at Seaton Delaval, was enlarged by Mr. Dobson for Sir Jacob Astley.

A catalogue of Mr. Dobson's works would be the history of nearly every territorial residence in the county. One of his earliest works was a house for Mr. Nicholson, at Earsdon, Northumberland, in 1813. This was speedily followed by Bradley Hall and Birtley Hall, Durham; Prestwick Lodge and Cramlington Hall, Northumberland; Benwell Grove and Villa Real, near Newcastle; Belford Hall and Doxford House, Northumberland; Biddleston, Flotterton, Longhurst, Newbrough, Acton, and Coxlodge, large mansions in the same county.

As Mr. Dobson's reputation began to extend beyond the limits of his own county, he was called in to design houses, churches, and castles in other parts of England. He built a large house for Mr. Harrison, at Whitehaven; another for Mr. Beadle, and one for Mr. John Dixon, both near Carlisle; Inglethorpe Hall, near Wisbeach, for Mr. Metcalfe; Oatland Park, near Windsor, for Mr. Hewison; and another house in the same locality for the Rev. Dr. Hawtry; Sittrington House, in Yorkshire, for the Rev. Mr. Long; the Scar House, in Arkindale, for Mr. Gilpin; the Parsonage, at Stockton, and Pennythorn House, Yorkshire; Greenwood Park, Hampshire, &c. Besides these, Mr. Dobson made extensive additions to Wynyard House, Durham, for the Marquis of Londonderry; and to Sudbrooke Holme, near Lincoln, for Col. Ellison, and received from a German nobleman a commission for a castellated mansion on the Rhine, the plans for which he partly furnished, but from the great distance from his own place of business he could not conveniently complete the work. The following mansions in his own neighbourhood, in addition to those already named, were also either entirely rebuilt or received large additions from his designs:—Cheeseburn Grange, Unthank House, Falloden, Backworth Hall, Hamsterley Hall, Minsteracres, the Museum at Wallington for Sir Walter Trevelyan, Nunnykirk, Gosforth, Shawdon, Blenkinsopp Castle, Whitburn, Hollyen Hall, &c.

The churches built from Mr. Dobson's plans were very numerous. When he first began his career Gothic architecture was lightly esteemed, and the same taste which induced Sir Christopher Wren to replace one side of the cloister at Lincoln with an arcade of Roman design, was still rampant. The church of St. Thomas, Newcastle, one of the first designed by Mr. Dobson, bears marks of the timidity with which architects then ventured upon the Mediæval style. It was, however, in advance of the period. The first church built from his design was the Scottish church at North Shields, in 1813. In 1817 he furnished the design for the restoration of Tynemouth Priory, the repairs of St. Nicholas' steeple, and the warming of the church, which work was succeeded after some interval by the beautiful florid Gothic window at the end of the north transept. In 1817 Mr. Dobson was called in by Col. Beaumont to restore the east end of Hexham Abbey Church. The private chapel of Mr. Riddell, Cheeseburn Grange; the Independent chapel, Sunderland; churches at Belford, Haltwhistle, Gilsland, Greenhead, North Shields, and chapels at Heworth, Gloucester, Eglingham, Dinnington, Cowpen, Monkwearmouth, and restorations of Hartburn and Marsdale, showed how industrious he was. He built a church at Carlisle for Mr. Peter Dixon; Trinity Chapel, Gateshead, and Alwinton Church; and in 1843 he began St. Peter's Church, Newcastle. Jesmond Church, a church at Monkwearmouth, another at Hendon, Lynn Church, at Warrington, Cheshire; St. Stephen's, South Shields; St. Mary's, Jarrow; and St. Mary's, Rye Hill, were built, and a number of others repaired or restored, besides schools built, cemeteries laid out, and some restorations of difficulty such as those of Houghton-le-Spring and Warkworth, were completed.

The restoration of Lambton Castle for the Earl of Durham offers an instance of the invention of the architect. The coal-workings under the castle had been filled with water at the time when some of the more modern additions were made; and this work, by the drawing off of the water in subsequent mining operations, was dislocated from top to bottom. Parts of the ruin were not worth preserving, and Mr. Dobson condemned them to destruction; but he has succeeded in restoring the parts worthy of preservation by going down into the mines, building up from the bottom where he found a solid foundation, in no less than three distinct and completely excavated seams of coal, with solid brickwork, and wedging up the walls to the perpendicular. Before, however, the whole of the additions to the building were completed, Mr. Dobson's health became impaired, and his



NEW FONT FOR BOMBAY CATHEDRAL.

plans have since been carried out under the direction of his son-in-law, Professor Smirke, R.A., who will doubtless now act elsewhere in a similar capacity.

The laying out of the new cemetery at Jesmond, Newcastle, afforded Mr. Dobson scope for the display of his ability both as an architect and a landscape gardener, and the result is well worthy the attention of the student as an excellent example. The versatility of Mr. Dobson's talent in turning his hand to work of any kind deserves to be mentioned. The timber framework used as staiths for shipping coals on the Tyne, showed that Mr. Dobson was master of carpentry; the graving-dock designed for Messrs. Smith, at St. Peter's ship-yard, proved him an engineer; and the warehouses built at the docks at Sunderland and Jarrow showed that the most massive construction came as easily to his hand as the Gothic church or luxurious mansion. The Central Railway-station of the North-eastern Company at Newcastle is perhaps Mr. Dobson's most important work; and though the work as actually executed falls far short of the original design, it is still a fine and imposing structure, and shows the skill with which the architect met and overcame the difficulties of the situation, and the foresight with which he made arrangements for accommodating the additional business which he clearly knew was likely to result from the development of the railway system.

The construction of the High-level Bridge and the passage of the Newcastle and Berwick Railway through Newcastle, involved an immense destruction of house-property; and here Mr. Dobson's services were called into requisition, in the settlement of compensation to the owners of the property destroyed. His knowledge of its value, and the implicit confidence placed by the owners and occupiers in his honesty and impartiality, enabled Mr. Dobson, in conjunction with the late Mr. Robert Wallace, the town-surveyor of Newcastle, to adjust all the claims for compensation, without carrying (with one exception) any of the claims into a court of law. In these respects, no less than in respect to his skill in architecture, the death of Mr. Dobson will leave a blank not easily supplied; for in the settlement of all kinds of disputes within a very wide range from Newcastle, the sound judgment and dispassionate temperament of Mr. Dobson were successful in extinguishing litigation. When Mr. Grainger was changing the entire aspect of the town, by the erection of the streets and public buildings which have shed a lustre upon his name, Mr. Grainger never failed to award to Mr. Dobson his obligations for the advice and valuable suggestions that gentleman gave him whenever he was consulted.

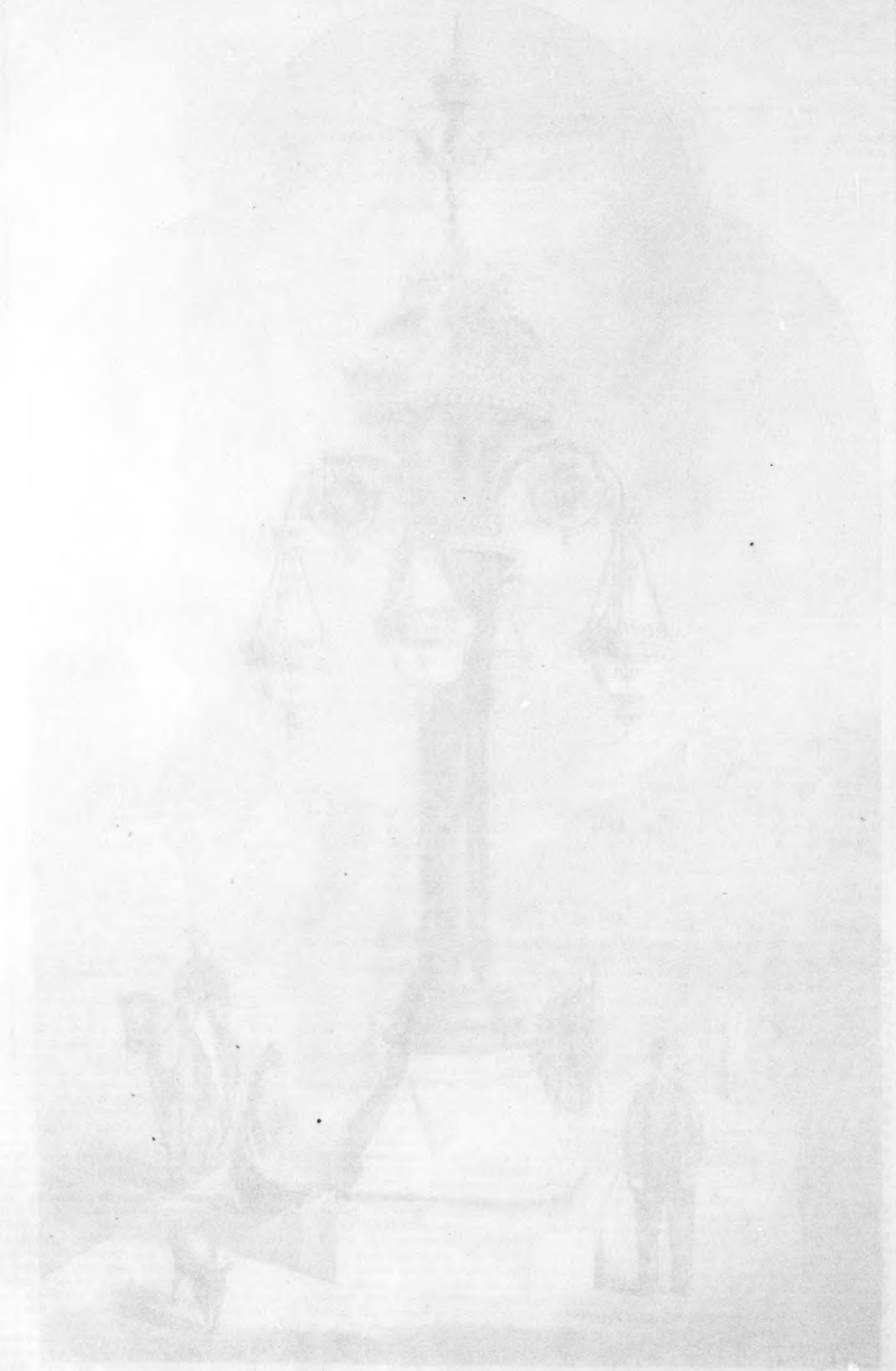
One of the earliest of Mr. Dobson's miscellaneous works was the Royal Jubilee School, Newcastle. In 1819 he planned, for Colonel Birch, additions to the fortifications of Tynemouth Castle, which have been lately supplemented by a fosse, also, it is said, designed by a civil engineer. Mr. Dobson was also employed by the Government on extensions or alterations of the Custom-houses at Glasgow, Newcastle and Liverpool. The Royal Arcade, Newcastle was from his designs. He prepared plans and sections for the Newcastle and North Shields Railway. Of hydraulic works, Mr. Dobson executed several. He designed St. Peter's Dock, near Newcastle, for Messrs. T. & W. Smith; a dock for Mr. Robson, at North Shields; and Seaham Harbour, for the Marquis of Londonderry. In connexion with ornamental park-like grounds, ornamental water was a necessity, and the lake at Bolam, the seat of Lord Decies, in Northumberland, was his principal work in this department. Mr. Dobson also executed for Mr. George Hudson, baths, streets, terraces, and the general arrangement of the new town at Whitby, and designed for other proprietors the baths and terrace at Roker, near Sunderland.

Many of the mansions designed or altered by Mr. Dobson are of large size, and would be worthy of an extended notice. The design for the Central Station at Newcastle procured the honour of a medal at the Exhibition of Paris, in 1855; but this appears to have been the only public recognition his services ever received. He was the first president of the Northern Society of Architects.

We have here given but a meagre sketch of a most industrious, prolific, and valuable life; but we must not close it without bearing witness to Mr. Dobson's upright conduct as a man; his generous and kindly nature. The profession has lost a very eminent member, and Newcastle a distinguished and most respected citizen.

LAMP AND VENTILATING SHAFT ERECTED OVER THE SUBWAY, SOUTHWARK STREET, LONDON.

EXECUTED BY MESSRS. WALTER MACFARLANE & CO., UNDER THE DIRECTION OF MR. BAZALGETTE.



THE LATE MR. EBENEZER TROTMAN, ARCHITECT.

MR. TROTMAN died, we regret to say, at his house in Park Village East, Regent's Park, on New Year's Day. He was in his 56th year. His name was probably better known a dozen years ago, young as he was comparatively, than it is now. Mr. Trotman was the son of a Baptist minister at Tewkesbury, and was a nephew of Sir John Easthope. He was educated at the Mill Hill Grammar School, and was subsequently articled to Mr. William Wallen, a well-known surveyor, in Little Moorfields. Soon after he left him he entered the office of Mr. Tite, first as a junior clerk, but finally Mr. Trotman became his principal assistant, and had much to do with his large business, being greatly employed by him, and representing him in very extensive works in Edinburgh and Perth in connexion with various railways, as well as in London. His health failing him, he gave up his position with Mr. Tite, and was succeeded by the late Mr. Charles Porden. Mr. Trotman was an excellent draughtsman, and had obtained a great mastery in the details of Gothic architecture, which he exhibited in a paper read by him at the Institute about thirteen years ago, wherein he showed the results of his curious researches in hundreds of our country churches. He wrote, amongst other contributions, an article on Tudor architecture in "Loudon's Encyclopædia," which attracted much notice at that comparatively early period.

His health was feeble, and before he left Mr. Tite he showed symptoms of the disease which finally terminated his life, viz., softening of the brain. He was in every sense a gentleman.

NEW FONT FOR BOMBAY CATHEDRAL.

WE have much pleasure, on the present occasion, in placing before our readers a faithful representation of a new font, that now is on its way towards a baptistery which awaits it in the Cathedral of Bombay. The font is a gift, a thank-offering from an English gentleman, a resident in Bombay, who for many years has devoted himself, with energy and gratifying success, to the promotion of various important public works for the improvement of that great city. To the senior chaplain of the cathedral, the Rev. W. B. Fletcher, was intrusted the duty of seeing that the wishes of the donor of the font should be carried into effect. Acting upon the advice of a common friend, Mr. Fletcher placed himself in communication with a brother clergyman at home, an experienced student of ecclesiastical architecture, with a request that he would send out to Bombay a design for the required font. His design having been received with cordial approval by the Bishop of Bombay, by Mr. Fletcher, and the cathedral architect, as well as by the donor, the Rev. Charles Boutell was requested to commission a sculptor to execute the font under his own superintendence in London. Mr. James Forsyth received this commission, and he has produced this new font for Bombay Cathedral in a very satisfactory manner.

The cathedral of Bombay is an edifice built in conformity with what we know as Norman architecture, the new font, accordingly is designed with a view to harmonize with the Norman Cathedral of Bombay. This font, which is of full cathedral proportions, is formed from a single block of Caen stone, the cluster of five dwarf shafts which support the bowl being of Serpentine and Devonshire marble. These shafts rest upon a basement also of Caen stone, and, in its turn, this basement is supported by a plinth with steps executed in basalt. The basalt portions of the work have been produced in Bombay, from drawings sent out for that purpose.

The bowl of the font is banded midway with the two passages—the letters being carved in relief,—"Suffer little Children to come unto me," and "Go and baptize all Nations." In connexion with these texts are four circular medallions, severally containing groups representing "The Baptism of Our Lord" and that of the Ethiopian prince, with the sacred monogram "I.H.S." and the date "1864." Below, the font is encircled with lotus-leaves, emblems of India; and above, a wreath formed from another lily, the lily of the valley, is typical at once of the Saviour and of baptismal innocence. The capitals of the four smaller shafts exhibit—sculptured with much freedom and vigour—the significant union of the flowers of the Indian lotus with the roses of England. Above, the font is finished with a plain chamfer; and the present cover, which is of oak, with a brass central ring, is of a simple character.

We have a view of the cathedral, as about to be recast, in progress, and shall publish it shortly.

LAMP STANDARD AND VENTILATING SHAFT, SOUTHWARK STREET, LONDON.

THE lamp-standard and ventilating-shaft represented by our engraving has been recently erected over the subway, Southwark-street, London. It is executed in cast-iron, for the Metropolitan Board of Works, by Messrs. Walter Macfarlane & Co., of the Saracen Foundry, Glasgow, and Bedford-street, Strand, London; and was done under the direction of Mr. Bazalgette, engineer to the Board.

This work shows, in a very marked degree, the improvement that is taking place in the cast-iron productions of our country, to which improvement in the ornamental branch of the trade the firm of Messrs. Walter Macfarlane & Co. have largely contributed. In the Exhibition of 1862 their works (to which we at the time drew attention) were sufficiently excellent to gain for them a prize-medal, their castings being characterized by the jury as "admirable, sharp, clean, and full of character." The work before us combines strikingly those qualities. The erection consists of a red sandstone base, about 5 ft. high, surmounted by ventilating shaft, lamps, &c., in cast-iron, about 27 ft. high, the whole forming a handsome central feature to the street crossing.

We must compliment Mr. Bazalgette, and all the parties concerned in this work. The cost of the lamp, without the stonework, will be about 255*l*.

THE SANITARY CLAUSES OF THE METROPOLITAN BUILDING ACT.

ON many occasions we have pointed out the failure of the sanitary clauses, few in number, of the present Metropolitan Building Act, and that, too, without any reflection on the District Surveyors. The following observations in the last report of the medical officer of health for the Whitechapel district (Mr. John Liddle), relate to the same subject:—

"The most important defect in the present Building Act is that which relates to the requirement of providing an open space of at least 100 square feet at the rear or sides of those houses in which all the rooms cannot be lighted and ventilated from the street or alley adjoining. But as nothing is said about the arrangement of such open space, it may consist of a slip of ground, being only 1 ft. in width and 100 ft. in length; or it may be of any other shape, if only the 100 square feet, required by the Act, has been provided. Not a word is said in the Act respecting the necessity of there being a window opening into this space. The Act is also silent upon the size of the windows in any of the rooms in a house, and of the height of the rooms, except those in the basement and attic, when these rooms are let as separate tenements. Every room, used as a sleeping-room, should be at the least 8 ft. in height.

To show how the spirit of this Act has been evaded in this district, I may, in addition to the instance in Osborn-place above-mentioned, bring to your recollection the fact, that in 1861 four new houses were erected in Bear's Head-yard, upon a space of ground, on which only two houses should have been allowed. One of these houses, No. 2, has a narrow passage by the side of it, in addition to the open space forming the court in front, so that all the rooms in this house are said to be lighted and ventilated, and therefore an open space at the rear is not required. The yard at the rear of this house is apparently common to it and to No. 1, but as No. 2 does not, according to the Act of Parliament, require an open space in the rear, the yard, which is exactly 100 square feet, is said to belong exclusively to No. 1. As it was found to be impossible, by any contrivance, to give to the house No. 3, which was intended to contain two rooms on a floor, a space of 100 square feet at the rear, the builder was compelled to make only one room on a floor, whereby all the rooms could then be said to be lighted and ventilated in front, consequently it was not necessary to provide any space at the rear of this house. The yard, therefore, which ought to be common to it and the next house, is said to belong exclusively to No. 4.

Again, in Queen's-place, Whitechapel, two dwelling-houses, of six rooms in each, have been erected, with a space at the rear of only 50 ft. to each. It was obvious, in this case, that the buildings were not in accordance with the requirements of the Building Act, and on complaint being made of the want of sufficient space at the rear of these houses, the owner caused a door-way to be made in the party-wall, between these houses. This arrangement was said to be legally sufficient to convert these two houses into a single house, whereby the entire space at the rear, which is 100 square feet, is all that the Act requires.*

Upon the same principle, half a dozen or more houses may be converted into a single house, while the open space in the rear for lighting and ventilating the back rooms may not exceed 1 ft. in width, provided that the building extends 100 ft. * * * *

The following case will further show how the provisions of the Building Act have been evaded. The landlord of some old houses in a court in Spitalfields thought it expedient to rebuild and enlarge them; but instead of pulling them down at once, as he ought to have done, he first took down the front walls only, and rebuilt them. He then took down the back walls, and rebuilt them. He subsequently took off the roof, and replaced it with a new one. By these proceedings he evaded the requirements of the Act relating to the structural arrangements of new houses; besides which, he was enabled to build two small rooms, 6½ ft. only in height, at the back of each house, without his being under the necessity of complying with the twenty-ninth clause of the Act, which relates to the providing of an open space of 100 square feet for the purposes of lighting and ventilation.

The width of *all* courts in which houses are to be built should be regulated by Act of Parliament. It appears, that in old courts, in which, perhaps, a warehouse, stable, or shed, has existed for a few years, the owner may erect upon the sites of these buildings dwelling-houses, and may let them out in tenements, without any regard being had to the width of the court, because it is said to be an *old* court, and no power is given to any authority to limit the height of the houses built thereon; but in a new court, a bye-law of the Metropolitan Board provides, that an open space of 20 ft. shall exist between the houses on each side of it.

The present Building Act does not require a parapet-wall to be made. The want of such a protection to the public may be productive of danger to life. A tile, slate, or a quantity of frozen snow may fall from the roof and injure persons in the public streets. Neither is there any provision made to afford safety to the public in enabling them to make a speedy exit from places of public entertainment in case of an alarm of fire.

The law relating to the building of houses appears to be in this anomalous state, viz;—That houses can be built without suitable provision being made for the proper ventilation and height of the rooms; but after such houses are completed and let out in tenements, then, by virtue of another Act, the local authority may institute proceedings before a magistrate to prevent the occupation of any room which, in the opinion of the medical officer, is unfitted for the health of the occupants. It surely would be much better to prevent houses being built, unless every arrangement suitable for preserving the health of the occupants be first made, than to allow houses to be completed, and then to prevent the landlord from letting them.

At the present time large sums of money are being expended by some philanthropists, in erecting improved dwellings for the labouring classes, in the hope that such dwellings will not only directly benefit the occupants themselves, but will contribute indirectly to the general welfare of the whole community; but, unless the provisions of a new Building Act forbid the extension of buildings in unsuitable localities, and at the same time enact that all the rooms in dwelling-houses shall be sufficiently lighted and ventilated, the labour, time, and property of such kind-hearted persons will be, to a certain extent, thrown away."

* We must conclude that the two houses were in the same occupation, or the arrangement would be illegal.—ED

ART-WORK IN THE FUTURE.

SIR,—I must call attention to some remarks made by you at a recent meeting of the Society of Arts on the subject of "Art Industry," as it is to be greatly feared that without it they will not accomplish the good which you doubtless intended they should do. To my mind they seem to be most important and pregnant of consequences.

The first is, "that it is a most lamentable fact, that notwithstanding what has already been done, the great body of building artisans of the present day are inferior in skill to the same class of artisans of seventy years ago." It is, as I think, simply impossible to say more than this. It condemns modern art as the production of the workman, and, as well as this, *all* our present *means* of art-instruction, as attempting to influence the art results of the age in which we live. Now, the first questions are,—is this true? and can it be proved, that our workmen are inferior to their fellows of seventy years back?

I do not think it possible for any one to look attentively at any object left us from the days of which you speak, "seventy years since," without acknowledging at once that the art-skill of that time found its way to *material*; and was not, as it now so unfortunately is, wholly expended on *paper*; and in efforts at representing objects on a flat surface, and in mere *drawing*. Almost any of the objects left us, as articles of furniture, chimney-piece ornaments, glass, plaster-work, wood carving, and others, will show this; and, what is more, any attempt now-a-days to get them *imitated* by our present race of workmen is impossible. Why is this? At that time there did not exist a single drawing-school of any kind to which the *workman* could go; all were under the baneful system of the old drawing masters, simply to be described by saying that the mode of work was not to imitate any natural thing whatever,—its virtue was the *touch* of the drawing-master. Without any kind of art-instruction, therefore, what was the secret of the success achieved? It was, as I conceive this: that the executive workmen were looked to as the sole means, *individually*, of producing the art result whatever it was. Any object of that date will evidence the fact that but one workman was employed on it. The object was commenced and completed, *i.e.*, its artistic portion as a picture, by one art-workman. And that the object itself was the sole subject of interest; and, what is more than all, and is in reality the key to a new system of art-action, it was *designed in material*. It was all the very reverse of the present method. The art-action is now wholly expended on paper, and the object itself left to be manufactured,—no one looking at it or caring about it until it is too late to alter or amend,—until it is finished and ready for its destination. I consider, therefore, your remark to be capable of absolute and ocular demonstration; and if so, that it demands an entire change in our present complicated and costly system of art-instruction, whether supported by public money or the result of private efforts. It is, if you are right, both false and useless.

To those to whom this subject is new, a great deal of explanation and detail would doubtless be required to convince them of the necessity of organic change in the whole modern system of art-production, and this cannot be done within small compass. I can only hint at the means of change, and indicate, as you have done, its true direction. But as an additional proof of the correctness of your view, I need but repeat your other remark, in which I entirely concur,—that the withholding the promised prizes for the wood-carvings, by the Architectural Museum committee, did not meet with your concurrence. How unfair this is! We are all now, to a man, engaged in the indication on paper of what is to be, and in afterwards knocking the object together anyhow by the modern system of manufacture, wherein one man is appointed to undo what his predecessor in the work has already done. In *cabinet* painting only do we ever see what the artistic power of the time can do; and now we are *beginning* a great change—we are asking for the signature of our common and unlettered and untaught workmen. They give us their handwriting, rough and ignorant as it is, and it is simply and rudely thrown aside as worthless rubbish! I have been many years at this work, and I protest against this injustice and this unkind rudeness. I have no hesitation whatever in saying, that some parts of the panels exhibited, especially in the details of the foliage, and even in some signs of animal life shown, Ghiberti himself need not have been ashamed of. Such work, as a whole, is now, as I take it, beyond the power of our Academician sculptors; *they* would only succeed in bits here and there; *they* could not rival the past: how much less a workman with every modern art, influence, and help flying away clear past him, and missing, as it does, both him and everything else capable of affording a practical art result? More might be said. I agree with your *dictum*.

You say, further on, that lectures are good things in their way, but not enough,—"*there must be actual practice in the studio and workshop.*" It is in this short sentence that I think the workmen themselves will in the future have good cause to thank you for showing them the way; but they must demand it, and perhaps plead for it. It is in the workshop and the studio, and, I would add, in our great public collections, that the workman must seek for help, and must practise the fine art of his trade. The whole of the present paper system of art-work must be abandoned before any *material* will consent to show what nature it is of, and how the art power in humanity can impress itself, and become visible either to the artist-workman's own eye or to other men's. It is pitiable to think of the cost to the public of our museums, and the little good they are doing, or can do, as things now are. In place of the dull and stupid school-room and the worthless reams of paper and cardboard wasted in them, the artists and workmen of to-day must be encouraged to seek instruction and help in the museums and in the midst of their collections of fine-art handwriting. And each artist and workman must be led to express himself in his own individual way in *material* inspired by the works about him. This but once commenced, we shall soon see the value of the art faculty of the age we live in, and of each individual exponent of it; and, perhaps, in time look down on those who now as *art capitalists* are so unrighteously using this art faculty at second-hand and without acknowledgment, and reaping from the toil of others both wealth and fame—wealth from the work of their hands, and fame from the work of their brains. It is only public ignorance that permits this, or can perpetuate it for another hour.

I must, therefore, again repeat that I think your remarks at the Society's meeting were most valuable, and that they should be acted on and enforced; and it is to help in this that I have ventured to trouble you with this letter.

C. BRUCE ALLEN.

ARCHITECTURAL INSTITUTE OF SCOTLAND.

THE following abstract of the treasurer's accounts with the Architectural Institute of Scotland, for the year ending 31st of October, 1864, is given in the report just published:—

CHARGE.

I.	Balance in account with British Linen Company's Bank at close of last account	£109	19 8
II.	Annual subscriptions for 1863-64, received	88	4 0
III.	Arrears of former year's subscriptions received	3	3 0
IV.	Interest on account with British Linen Company to 15th April last	3	6 10
V.	Special fund for endowing a Chair of Architecture, consigned in British Linen Company's Bank, dated 31st October, 1863 ..... £19 14 8		
	Interest thereon to Oct. 31, 1864 0 15 3		
		20	9 11
VI.	Miscellaneous receipts	1	12 6
	Balance due to Treasurer at Oct. 31, 1864	6	9 0
		£233	4 11

DISCHARGE.

I.	Balance due to treasurer at close of last account	£17	1 1
II.	Rent, taxes, &c., paid for rooms	16	10 0
III.	Expense of prizes	15	9 0
IV.	Expense of lithographs of Roslin Chapel	49	8 0
V.	Accounts paid for printing, advertising, &c.:—		
	1. Printing £21 0 0		
	2. Advertising 1 6 6		
	3. Books, stationery, &c. 0 16 6		
		23	3 0
VI.	Miscellaneous general expenses: including expenses connected with meetings, insurance, secretary and treasurer's outlays, postages, carriages, and expenses of collections	32	2 5
VII.	Amount in deposit receipt of British Linen Company, on account of fund for endowing a Chair of Architecture, dated 31st October, 1864	20	9 11
VIII.	Balance in British Linen Company's Bank at 31st October, 1864	59	1 6
		£233	4 11

Mr. Miller having resigned the office of honorary secretary, Mr. John Fleming Rodger has undertaken the duties.

A general meeting of the Institute was to be held on the 12th inst., "To consider the question of a site for the Scottish Memorial to his late Royal Highness the Prince Consort; and, if need be, to memorialize the Royal Committee of Advice on the subject."

THE BIRMINGHAM ARCHITECTURAL SOCIETY.

ON the 4th, the members of this Society commenced the business of the year by a dinner. The chair was occupied by Mr. Thomson Plevins, president of the Society, and there were also present Messrs. A. B. Phipson (vice-president), J. H. Chamberlain (hon. secretary), J. R. Botham (treasurer), J. J. Bateman, J. G. Bland, J. A. Chatwin, J. Cranston, B. Corser, W. Harris, E. Holmes, W. Martin, T. Naden, C. J. Newey, F. B. Osborn, E. J. Payne, H. Yeoville Thomason; and J. T. Bruce and Allen E. Everitt, honorary members.

The President, when proposing the toast "The Birmingham Architectural Society," read an address, in which he named Mr. Botham as the founder of the society.

"For the information of those who, like myself, did not belong to the Society in the early years of its existence, it is perhaps well for me to notice that it was started in 1851, and when I tell you that immediately upon its foundation twenty-one gentlemen became members, and that at this period the number of architects practising in Birmingham was only about twenty-six, you will agree with me that it was started under most favourable auspices, and that many thanks are due to Mr. Botham, and those who worked with him. When the Society was formed it had in its ranks a majority of the profession, and its conclusions, therefore, fairly represented the views of the architects of the town. But since then its position in this respect seems to have altered, and now, although knowing, as I do, that we rank amongst us some of the most respectable members of the profession, yet, seeing so many as worthy not in our Society, I cannot flatter myself that the meetings of our little unexceptionable body have so much influence as they should have, either with the profession generally or the public."

"One good result which I hope for, in connexion with the extension of this Society, is an understanding amongst all the respectable members of the profession, as to the uniformity of percentage for certain work, and a conviction in the minds of the public that it is not even to their interest to pay less. The profession to which we have the honour to belong is certainly deserving of more consideration than the public sometimes accord to us; for I do not hesitate to say that many of our members would far rather sacrifice their own interests than those of their employers: but this high state and honourable feeling have only been cultivated, and can only be perfected by the public generally treating architects as they deserve to be treated—with consideration and confidence; as men having a reputation at stake and an independent position to maintain."

The toast was duly acknowledged by Messrs. Chamberlain, Bateman, and other gentlemen. The various speakers strongly urged the importance of reviving the Society, widening its basis, and including amongst its members the leading architects of the district as well as of the town.

SOME OF THE CAUSES OF LONDON FIRES.

A CAREFUL inquiry into the causes of those conflagrations which in both the day and the night are constantly alarming some part of the metropolis, would discover curious results, and would show that with carefulness and better management a large percentage of those calamities might be avoided. We will now, however, just glance at a few of the chief means by which property of enormous value is annually consumed, and not a few lives are lost, in the capital alone. In warehouses there is the risk of spontaneous combustion, in consequence of the careless packing of goods; the storing of highly inflammable and other matters in places of such huge dimensions that when a fire once gets head the separation walls are found insufficient, and, in spite of the exertions of the firemen, destruction spreads from one range of warehouses to the others, until the whole range of premises is destroyed. This has been shown in a remarkable manner in the great fires at Alderman Humphery's wharf, London Bridge, and the more recent conflagration at Dock-head. The writer has often heard the late lamented Mr. Braidwood express his opinion very strongly respecting the danger of large interiors for the storing of goods; and the truth of his opinions in this respect has been borne out on several occasions, especially on that when his valuable life was lost. The leakage and explosion of gas are also a prolific cause of London fires. Many accidents of this kind have occurred in drapers', milliners', and other shops of this description; and it is not likely to be known how many mysterious fires are to be attributed to the spontaneous and

accidental lighting of lucifer matches. In the heat of summer, in over-heated workshops,—even by the falling of a lucifer match, or a box of them, from a mantel-piece, or by children playing with them, and other causes,—many accidents occur. We remember a case of fire which was attributed to the firing of lucifers by means of the concentration of the sun's rays through one of the old-fashioned bulls'-eyed window panes of glass. If we could get a correct estimate of the value of the property which has been thus destroyed, it would show surprising figures. Chimneys and flues are also a source of mischief, especially where care is not taken in the cleansing of them. Firework and lucifer-match manufactories, which should not now be allowed to remain in the metropolis, add to the chapter of accidents; so does the drawing of turpentine, camphine, and such-like articles, at night-time or in the day, in dark cellars, &c., where candle-light is needed. Nine out of ten of those fires might be prevented by the use of proper lanterns. In the London oil-shops gunpowder, even for the blowing up of copper-holes, is not sold after the gas is lighted: some such provision would be useful in connexion with the sale of other dangerous articles. Servants, children, and others often carelessly place lighted candles in cupboards or under shelves, and, forgetting where they have left them, the woodwork takes fire. Drying clothes in front of the fires of tenemented dwellings is a cause of damage; as is the arrangement of stoves for glue-melting, carelessness in casting about shavings, the smoking and lighting of tobacco-pipes, the use of candles without lanterns in stables and the stores of corn-chandlers, &c., &c. We have known two or three fires to have occurred in consequence of placing hot ashes in the dust-heaps adjoining premises. Crinolines have added to the number of fires, and been the means of the loss of life and property. The cause of many fires which occur about rent-day, or where the premises are well insured, will for the most part remain amongst the mysteries of London.

It would be well if the stacking of immense quantities of wood in populous neighbourhoods were prevented. Some of the largest of the London fires have occurred from this cause. In connexion with this matter much remains to be done in the arrangements needful for the public safety.

SANITARY MATTERS.

Stamford.—Scarlet fever is very prevalent in Stamford at the present time, chiefly on the St. Martin's side of the river. In one house in Water-street, one day last week, three of a family named Ingram lay dead, and two others were in a dangerous state. The village of Empingham is also suffering severely from fever.

Lincoln.—The town council have unanimously resolved—"That a committee of three, together with the corporation surveyor, be formed for the purpose of obtaining all necessary information which has for its object the improved drainage of the city: and for this purpose the committee is authorised to go and inspect works in other places where the drainage has been improved, and ascertain the expense which has been incurred in forming them, and carrying them out, and report to this council on the subject; and that the following persons form the committee:—The Mayor, Alderman Foster, and Mr. Doughty."

Great Ormesby.—For eight months or so past this parish has been scourged with diphtheria. During the hot weather fourteen deaths occurred from this cause among 800 inhabitants. Since then there have been many cases, though fortunately not fatal. Now, however, this disease, in a most malignant form, has reappeared in the filthy part of the parish called Wapping.

Bury.—Malignant fever is reported to be very prevalent at Bury at present. Two or three persons in a house have, in some instances, been carried off by it. One of the measures taken by the authorities was to send the bellman round the town, directing the people, among other things, to keep their children in the house at night, as a precautionary step. The precise reason for this is not stated.

Gloucester.—The number of registered deaths in this city, during 1863, including those in the public institutions, amounted to 1,066, being at the rate of 29·54 per thousand of the population, or 1 death in 34. The average number of deaths per annum, for the last twelve years, has been 665 (665·16), being at the rate of 20·28 per thousand, the average rate of England being 22·14 per thousand. The enormous excess (9·26 per thousand) of the death-rate of 1863 over the average annual death-rate is attributable to the epidemic of scarlet fever, which raged with great severity during the year, and caused the deaths of 192 persons. The deaths of children under five years of age amounted to 51·13 per cent. of the mortality at all ages. For the last five years the average annual mortality had been at the rate of 37·89 per cent.

THE UTILIZATION OF SEWAGE.

THE Local Board of Health at Tamworth have awarded to Mr. J. S. Benest the first premium for his plan for works to utilize the sewage of that town. The plan is as follows:—The whole town is drained into one culvert, deep enough to intercept all the smaller sewers. This culvert is carried beyond the town to a point sufficiently distant to cause no nuisance to house occupiers. It there discharges into one or other of two reservoirs, or tanks, one of which fills while the other is being deposited and emptied. When deposition has taken place,—and it does so very rapidly,—the liquid will be conveyed away by pipes, and spread over the adjacent meadows. The thick deposit which remains in the tank will speedily become so hard that it may be carted away as ordinary farmyard manure.

The Bill which is about to be brought in by Lord Robert Montagu will probably contain the following permissive powers:—

1. It will extend to England, Ireland, and Wales, and will give increased facilities to towns for the utilisation of sewage and its application to land.
2. Power to acquire land by means of loans raised by mortgage of the rates.
3. Power to carry sewers and other ducts under and across roads, railways, and private lands.
4. Power to sell sewage to companies and others.
5. Power to advance capital, or to grant mortgages on rates to companies or persons contracting for sewage.
6. Powers to take foreshores and waste lands for reclamation.
7. Powers to the Crown, &c., to grant leases of land.
8. Pre-emption on reasonable terms secured to local husbandmen.
9. Power to take up Government loans.
10. Power to enable local authorities to combine for joint outfall and other purposes.

The Bill will also probably contain the following prohibitory clauses, chiefly with reference to the purification and conservation of streams and rivers:—

1. Water-shed Boards to be appointed for the conservancy of rivers.
2. The constitution and representation of local jurisdictions, &c., to be locally determined.
3. The Water-shed Boards to make by-laws to bind Boards of Health and other local authorities.
4. Power to remove obstructions from rivers and outfalls.

SEWAGE AS MANURE.

SIR,—I observe the paper on sewage in a solid form in the *Builder*. I pointed out a year ago that it might be, and was (on a large scale), put into a solid form for carriage when collected; and also, how it might be collected fit for the purpose.

This you thought a return to the "night-stool system" of France. It is indeed no such thing. The intercepting vessel may be outside the house; it may be in the drain beneath the ground. And I believe yet, when the bubble of making use of liquid sewage has been blown big enough to burst, that the best way of securing and using the solid matter in its *best* state will come to receive the notice it deserves.

I still say, that for all public buildings the new system now practised in several towns of France, Italy, and Belgium, is quite and easily applicable.

Private houses are another consideration, more difficult, doubtless. JAS. EDMESTON.

*** We are sorry to differ from our correspondent: but our objection to the system of retention advocated remains in full force.

"PLEASANT APARTMENTS."

SIR,—My attention has just been called to a paragraph in the *Builder*, headed "Pleasant Apartments in Paddington," which contains a very entertaining description of an underground dwelling in North-street. The writer concludes by suggesting the expediency of a sanitary inspection. In order that this state of things may be brought under the notice of the proper person, I beg to state that North-street is not in Paddington, but in Marylebone. J. BURDON SANDERSON, M.D., F.R.C.P.,
Officer of Health for Paddington.

THE CHIEF CLERKSHIP IN THE CITY ARCHITECT'S OFFICE.—The candidates for the office of principal clerk in the architect's department, Guildhall, so far as we have heard, are these:—Mr. T. Baker, who has been an assistant in the office for some years; Mr. C. Baily, of Gracechurch-street; and Mr. C. L. Eastlake, of Upper Berkeley-street West.

OUR HIGHEST SPIRES.

ST. JOHN'S, BURY ST. EDMUNDS.

As Mr. Denison, in his interesting statistics respecting our cathedrals and largest parish churches, has named among the "highest spires" two which are less than 160 ft. high, perhaps you will allow me to claim a place in the list for the spire of St. John's Church, Bury St. Edmunds, the height of which is 160 ft. to the top of the stone cap, or finial. (It has no weather-cock.)

The construction of this spire renders it especially worthy of mention, as, with the exception of the finial and stone ribs at the angles, it is entirely built of Suffolk white brick, together with its eight pinnacles and flying buttresses. The same material has been used throughout the church, even to the deeply-moulded ribs of the arches and capitals of the pillars, the style being Early Pointed. In giving 160 ft. as the height of the spire, I follow an account of the building published at the time of its consecration (October 21, 1841). In the architect's plan it was 165 ft.

C. J. GEDGE.

LINCOLN CATHEDRAL.

ON several occasions comments have been made in our columns on the mode in which the works have been carried on about Lincoln Cathedral. In reply to these and other floating objections, apparently, a semi-official statement has been made in the local papers. It says the works at the west front of the Cathedral are to be cautiously proceeded with under the advice of the same architect, Mr. Buckler, of Oxford, who has been employed for many years by the Dean and Chapter, and who has sanctioned and directed what has hitherto been done. Mr. Buckler had been desired carefully to inspect the whole, and he declares himself fully prepared to justify what has been done. What is now being done is to collect the remains of the old columns removed so long ago, and copy them in the minutest details in Lincoln stone (the original material), in order to replace the columns of Yorkshire grit; and at the same time to put in fresh pieces in those parts of the Norman doorways which are absolutely perishing from age, these parts being also copied by the masons employed. This done, the question was whether the new joints thus necessary to be inserted, unless the whole were to become a ruin, should remain a piece of patchwork, or whether the "scum" of age should be carefully removed from the old work that remains. Mr. Buckler affirms that it is a peculiarity of the Lincoln oolite, unknown to architects who have not employed it, to become coated with a hard surface which preserves it, and that all that is done at Lincoln is to remove the black sooty matter by which this surface is overlaid. This is done by first wetting the stone with water from a brush, and then taking off the black with a small tool, without either mallet or hammer, leaving the tool marks of the old Norman workmen. Not even this process, it is said, has been or will be applied to the Norman carvings.

FEVER CASES.

IN the last report of the Registrar-General, ninety deaths from typhus fever in the week, are recorded in the metropolis; eleven of these in the Greenwich district, which contains Deptford and Woolwich; and "eighteen deaths from typhus were recorded in Islington West," in which sub-district the London Fever Hospital is situate. But for the knowledge that this useful and extensive hospital was situate in West Islington, the number of deaths would be startling, and reflect discredit upon the sanitary state of this district. It is, however, not always that in the Registrar's report reference is made to the Fever Hospital as a means of increasing the death-rate from fever in this locality; and many persons even in Islington either do not know, or else forget, that the hospital to which the most serious fever cases are brought from all parts of the metropolis is in their neighbourhood. We have before referred to this, and suggested that in order to arrive at a truthful record of the deaths from zymotic diseases, which will show the sanitary condition of districts, that the deaths which occur from fever in such hospitals as this should be accredited to those parishes from which the cases are taken. Some time since we made inquiry, and found that the cases treated in this hospital were

brought from all parts of the metropolis, some of them from long distances; and a reference to the books of the hospital which record the names, places of residence, and other particulars of the patients treated there, would be a useful indication to spots which require sanitary improvement.

We read of eleven deaths from typhus in the Greenwich district, and, it would perhaps be found on inquiry that some of the eighteen persons who died from typhus in the hospital were brought from the same locality. Whether this may be so or not in the present instance, it is clear that West Islington should not be charged with the cases brought from elsewhere. We say this, although well aware of the extensive operations of the Registrar-General's office; and that it must cause a considerable amount of extra labour to introduce new divisions in the death reports. But, in a matter of this kind, we should not spare labour or even extra expenditure.

HOW WE MANAGE OUR ROADWAYS.

FOR months Long Acre was passed through with difficulty by reason of the new sewers that were being tunnelled for and built. At last, however, the heaps of earth and elevated windlass here and there disappeared, and drivers thought it all right again. So it was for a few weeks; when down came fresh invaders with enormous iron pipes, and the ground was again broken up, the traffic interfered with, the trade of the shops injured. The pipes have been buried and the men have departed; but will the thoroughfare now remain open, the business of the district go pleasantly on? Not a bit of it. Look at the condition of the roadway: the surface is destroyed; a passage over it is dislocating. An army of paviors must be called into action again to block up the roadway, and by the time they have restored the paving, an underground railway, a pneumatic despatch tube, or some new gas pipes will be ready for laying. And so we manage our roadways!

NEW CEMETERY FOR ASHTON AND DUKINFIELD.

THE Corporation of Ashton-under-Lyne, and the Local Board of Dukinfield, have united in the purchase of about 38 acres of ground, for the formation of a joint cemetery. The land was formerly a park, belonging to "Dukinfield Lodge," and in the days preceding the erection of cotton-mills, was a very delightful locality. It occupies an elevated position above the banks of the river Tame, and the cemetery, when laid out, will be a prominent feature in the surrounding scenery for miles. The works have been entrusted to Messrs. Paull & Ayliffe, of Manchester, architects, whose designs for the buildings and the laying-out have been formally approved. It is intended to employ distressed operatives on the earthworks, &c., and application has been made for a loan, under the Public Works Act.

The proposed outlay, exclusive of land, is about 17,000*l.*

THE BUILDING TRADES MOVEMENT.

THERE is great commotion amongst the operatives as to the "discharge-note," as the Master Builders' Association calls it, or the "ticket-of-leave," as it is called amongst the men. In Birmingham about 800 carpenters are on strike; in Coventry about 400 men, comprising all branches; in Walsall, about 400 of all branches; in Nottingham, about 700 ditto; in Malvern, about 100 ditto; and about 1,000 in other towns of the midland counties. In the meantime several meetings of the masters have taken place, and the subject of the "note" is understood to have occasioned warm and angry discussion. Some influential masters say they think it quite necessary that there should be a masters' association, to aid as a check upon the combinations of the men, but consider the "discharge-note," as proposed by the Birmingham executive of the association, an un-English weapon of warfare, to which they are entirely opposed. In the face of the opposition of the men, and the disapprobation of many of their own members, the Association will do well by at once abandoning the "note."

At Hull the subject of the "note" has been warmly discussed by the men, who have formally and unanimously protested against it, and resolved to support the men now out in opposition to it in the midland counties.

The carpenters and joiners of the Potteries and Newcastle-under-Lyne have published an address to the members of the Master Builders' Association, in which they declare that they have a desire to prevent the recurrence of unjustifiable strikes and combinations, and, for the sake of peace, request the Association to abandon the "discharge-note" which they have agreed to adopt, and to consent to a conference for the formation of a code of laws for the regulation of the trade.

It seems to be not merely unionists but non-unionists, also, who have resolved in many cases to resist the introduction of the "note," so that the unions are likely to be greatly strengthened by the threatened measure; and what looks no less serious as against the masters, is the fact that the disinterested feeling of the press appears to be everywhere against the "note."

The operative joiners in Nairn, Scotland, have petitioned their employers for a rise of wages. Their present wages for a week of sixty hours is only 16s.; and, as this amount is much below the general average in Scotland, they desire an advance of 2s. per week, and also that a regular pay-day be observed.

At the Warwick Quarter Sessions on Thursday, two brickmakers, named Stone and Gregory, were each sentenced to fourteen years' penal servitude for killing three and stabbing four horses, the property of Messrs. Lewis, brick manufacturers, at Aston. It seems that Messrs. Lewis had determined not to employ any men belonging to the trade union, and the destruction of the horses is supposed to have resulted from this decision.

FROM SCOTLAND.

Edinburgh.—The town council and railway companies meeting there have under consideration a scheme for a grand central station at Waverley Bridge, but nothing definite has yet been decided. The scheme, which seems to have originated with the council, is of a very comprehensive and rather costly character. It embraces the removal of the present Waverley Bridge, its place being supplied by a new bridge—probably of iron.——The statue of Professor Wilson is now ready, and a general meeting of the subscribers was held on Monday last, at the Messrs. Blackwood's, to receive the report of the committee, and to make arrangements as to the inauguration and future preservation of the statue. Dr. Robert Chambers, as secretary, read the report, which stated that the bronze statue was now finished, and the pedestal nearly completed, and that an early day might be named for the inauguration. Several gentlemen present remarked that Mr. Steell had succeeded in producing a striking likeness. It was remitted to the sub-committee to make the necessary preparations for the inauguration, which will probably take place on an early day in February, and on the same day as the inauguration of Mr. Steell's marble statue of Allan Ramsay.

Glasgow.—At the present moment, according to the *Citizen*, eight churches are in the hands of the builders here, and rapidly approaching completion; and if to these be added the churches opened within the last eighteen months, there is a total of eighteen added within the last two years to the number of churches in Glasgow, and at a cost of nearly 100,000*l.*

Dundee.—A deputation from the directors of the projected Albert Institute had a meeting with the town council to submit the plans of Mr. G. G. Scott, architect, for their approval. Mr. Baxter stated that it was Mr. Scott's opinion and that of the directors, that the Institute, if erected in the centre of the ground purchased (at a cost of 8,050*l.*), would prevent the Royal Exchange from being seen from the top of Reform-street. The plan showed the best position for the new building. From Mr. Scott's last communication to the directors, it appeared that his estimate for the great hall and the library together as shown on the plans—that is, for the main portion of the building fronting the west—is 8,400*l.*: for the corridor division—the portion of the building which it is proposed should front the north, consisting of the circular staircases, and the corridor—his estimate is 3,000*l.*: for the committee-room division—that which fronts the south, consisting of a variety of rooms above and below—his estimate is 3,000*l.* His estimate for the external staircase is 1,100*l.*, and for the ornamental spire 700*l.* The total estimate for the work, which includes the expense of piling, is 16,500*l.* The portion which is to be appropriated for the public library is on the ground-floor of the great hall section of the building, and the estimated cost of that will be 4,400*l.* As there was not at present sufficient money for the completion of the whole design for erecting all the buildings, the long building behind for the picture galleries and museum was abandoned in the meantime. It was proposed to take estimates for the work in sections,—for the great hall, the corridor, the committee-rooms, and other accommodation, and the external staircase. The subscribed funds up to this time amount to 23,260*l.* The council at a subsequent meeting unanimously approved of the plans, as amended.

Wick.—The new Free Church here, recently opened, is in the Perpendicular style, from a design by Mr. Gray, of Berwick, architect. The front elevation looks into Bridge-street. It is divided into three compartments. In the middle compartment there is a large central window of five lights, with pointed tracery; in the interior it is in great part concealed by the gallery. From the street view, however, this arrangement detracts nothing, as the windows are all filled with corrugated glass, not seen through. On the north or right-hand compartment of the front elevation stand the tower and spire, supported by diagonal buttresses, surmounted by crocketed pinnacles. The spire is angle-ribbed, and terminates in a sculptured finial, surmounted by a gilt copper cross and spear. The entire height of the spire from the foundation is 128 ft. From the position of the building, situate between the walls of adjoining houses, the front and spire are the only parts visible from the main street. The front measures 63 ft., and the length of the building backwards is 90 ft. The front is all built of Burghead freestone smooth-dressed. Messrs. Dunbar had the contract for the joiner work; the building contract was executed by Mr. Williamson; and the hewn work was done by Messrs. Hood & Henderson. The plumberwork was executed by Mr. Johnstone.

Books Received.

"Hardwicke's Science Gossip: Hardwicke." This fourpenny monthly is intended as a medium of interchange and gossip for students and lovers of nature. The first number only is out. It has an extensive field of subjects, and ought to interest a very numerous class of readers. The "Gossip" in this first issue is zoological, entomological, piscicultural, botanical, geological, microscopical, &c.; and it besides contains little papers on the Viper or Snake (illustrated); on Duckweeds (also illustrated); and on several other subjects, as well as reports of societies, notes and queries, &c.——The *Dublin Builder* has commenced the new year with vigour. The first number contains a lithographed view of Whitworth, Drogheda; architect, Mr. Barre, of Belfast.——The principal papers in the current *Gentleman's Magazine* relate to ancient monuments. The first is an account of the curious ancient slab which stands on the north side of the churchyard of Kirk Michael, in the Isle of Man, by the Rev. Dr. Dodds.——"The Garden Oracle and Floricultural Year-book, 1865. Edited by Shirley Hibberd, F.R.H.S., author of 'Rustic Adornments for Homes of Taste,' &c. London: Groombridge." The present issue is the seventh of this useful garden book. A leading feature of it this year is a list of stove and green-house orchids, arranged to exhibit certain kinds in bloom every day throughout the year. This is accompanied with hints to beginners in orchid culture, which seems to be likely to become the next popular mania that will follow in the wake of the aquariums and fern-cases.——"The Land and the Agricultural Population. Arundel: Mitchell, *West Sussex Gazette* Office." In 1863 Messrs. Cobden and Bright delivered speeches at Rochdale which the newspapers discussed, from the *Times* downwards. In the questions of entail and primogeniture, and parish settlements, brought forward in these speeches, the *West Sussex Gazette* took part, and the pamphlet under notice is a reprint of the correspondence published in that paper on the subject.——"The Concentration of the Courts and Offices of Law in London." The council of the Association for the Promotion of Social Science conceives this sub-

ject to be one of such great national importance that it resolved to address the members of both branches of the legislature, the municipal corporations of England and Wales, and the chambers of commerce, in connexion with the Association, as well as others, upon it, in the hope of exciting sufficient attention and interest to secure the acceptance, in the ensuing Session of Parliament, of the two bills which the Government have announced their intention of bringing forward for the fourth time. The pamphlet under notice is issued by the Law Amendment Society, in connexion with the Association, and one of the chief purposes in view is to show that the present condition of our courts and offices of law is not to be looked at as a professional grievance, but as a source of serious injury and loss to all suitors, and therefore detrimental to the value of all property; and that the proposed remedy will not add to the public burdens.——"The Brown Book" (Saunders & Ottley) has been improved by the adoption of the suggestion we made last year,—the addition of the artistic societies. The Art Union of London should be added to those given, and in the list of benevolent societies the Newspaper Press Fund should appear.

Miscellanea.

ANOTHER CHURCH DESTROYED BY FIRE.—Hopton parish church, midway between Great Yarmouth and Lowestoft, was destroyed by fire on Sunday. It was partially insured. There was no loss of life.

THE WEST CHURCH, GREENOCK.—To give credit where credit is due, we would add to our little notice of this church in our last, intimation that the carving about the pulpit and elsewhere was executed by Messrs. Roddis & Grassby, now settled in Glasgow.

LIVERPOOL ARCHITECTURAL SOCIETY.—At last week's meeting of council a letter was received from Mr. Charles Herdman, secretary of the Liverpool Architectural and Archæological Society, applying for the use of the Town-hall for a *soirée* in behalf of the funds of the Architects' Benevolent Society. The letter was referred to the finance committee.

THE LIVERPOOL BUILDING SURVEYORSHIP.—The special committee as to the office of building surveyor submitted a recommendation to the council that the salary of the officer to be appointed be 300*l.* per annum, and that Mr. G. H. Rollet be appointed to the office at that salary. Eventually a resolution was unanimously adopted, referring the subject back to the special committee for reconsideration.

RESTORING ENAMELS.—Mr. Hatfield, who is known as a worker in bronze, has been lately applying himself, and with great success, to the restoration of Chinese enamel work. We have seen two or three fine jars previously black, damaged and ugly in consequence, that have come out beautifully under his hands. He appears to work down the whole surface to the fine partitions of metal that divide the enamels, gilding the edges of these lines, and filling in with coloured composition where the enamel has been injured.

PROPOSED INDUSTRIAL EXHIBITION IN BRISTOL.—A meeting of delegates of trade and other societies, in Bristol, has been held, to consider the propriety of holding an industrial exhibition in this city. The matter has been taken up with spirit by the working classes, and several influential gentlemen have promised their aid. At the meeting a preliminary committee was appointed, to confer with the sub-committee of the Working Men's Club, and to attend a public meeting, to be held on the 1st of February.

SANITARY CONDITION OF OUR IRON SHIPS.—The *Caledonia*, iron-clad, has been undocked at Devonport yard, and taken into the basin at Keyham, after having been in dock for several months past, getting her sides pierced for ventilation, and other arrangements made for the discharge of waste water. One cannot help expressing a little surprise that, while in the construction of our navy the minor details receive so much attention, this essential provision should have been overlooked, especially in iron-plated ships. It is said that in some vessels, particularly in passenger ships, the iron beams have been cased over with wood, with very great advantage to the health and comfort of the persons on board.

THE VOLUNTARY EXAMINATION, 1865.—The number of candidates who have sent in their applications for voluntary examination, this session, is three in the Class of Proficiency, and one in the Class of Distinction, which being less than that required by the printed regulations, no examination will take place in January, 1865.

WALTON SURVEYORSHIP.—At the monthly meeting of the Walton Board, the chairman stated that the committee appointed to consider as to the proposed surveyorship had made inquiries, and they had agreed to recommend one of the firm of Reade & Goodison, architects and surveyors, Liverpool. He understood that although they could depend upon the practical services of both those gentlemen, it was only necessary that one of them should be nominally appointed. The recommendation of the committee was approved of, and the name of Mr. G. W. Goodison was entered on the books as surveyor.

MEMORIAL TABLET.—Mr. S. C. Hall, during a lecture he recently delivered in Wexford, suggested to the people of that town that they ought to erect a marble slab in front of the house in Corn-market, where was born the mother of Thomas Moore, the poet. The idea was a good one; but the necessity for any joint action in the matter on the part of the people has been rendered unnecessary by the mayor, Mr. John Greene, J.P., who has put up the slab at his own expense. After stating that Mrs. Moore had been born in the house, the legend on the slab goes on to state that, on the 26th of August, 1835, the poet returned to it "in the zenith of his imperishable fame, to render homage to the memory of his mother, whom he venerated and loved."

THE LAST-FOUND STATUE, ROME.—Contradictory rumours have been circulated with regard to the colossal statue found in the excavations of the Righetti palace. It is true that the Czar offered 370,000 scudi for the piece, and other high personages followed suite; but it was an error to state that Signor Righetti, obeying a sentiment of patriotism, had offered it at half the above price to the Pope. The truth is that the spirited proprietor, from a feeling of patriotism, would not allow the statue to be sold to a strange country, so he simply and purely presented it to the Pope, who, not to be outdone in generosity, inscribed Signor Righetti on the civil list for an income of 2,500 scudi, representing a capital of 50,000 scudi. The Pope has also presented Signor Righetti with a superb gold snuff-box, and each of his children with a rouleau of 1,000 scudi in gold.

THE LATE MR. BRASH, BUILDER.—Died at his residence, Monkstown, Cork, on New Year's-day, Mr. William Needham Brash, builder, aged fifty-four years. The deceased was, for a period of thirty-two years, one of the most eminent builders in the south of Ireland, and was greatly esteemed for the honesty and unflinching integrity of his character. He was a man of great practical knowledge and skill in every department of a business now too often intruded upon by men ignorant of its commonest details. The last works executed by him were the National Banks at Cork and Clonmel, and a large villa residence at Queenstown. On the completion of the first-named edifice, he was presented by the directors with a gift of one hundred sovereigns, as a testimony of their appreciation of the fidelity with which he had discharged his engagements to them. Mr. Brash had just retired from business, having realised a comfortable independence.

A NEW "SEVERN BORE."—It is proposed, says the *Bristol Times and Mirror*, to tunnel under the bed of the Severn for a distance of three miles; and through this subterraneous or rather sub-fluvial gallery to carry a railway, so as to connect the South Wales Union line with the Principality. The promoters and the engineer of the South Wales Union declare it can be effected, and, as the estimated cost, name 750,000*l.* It is argued that the nature of the soil is particularly favourable to the work, being a substratum of marl, with a roofing of red sandstone. It has a rival in another project, namely, a bridge to span the river from Aust to the Chepstow bank, to be two miles in length, and laid with a double line of rails. This structure is to be supported on piers, which, from sunken base to summit, shall be each as high as the London Monument, and with a span between each of 600 ft., the estimated cost being 1,800,000*l.*

THE SHEFFIELD INUNDATION COMMISSION.—An important judgment has been given by the Inundation Commissioners on one branch of the numerous claims for consequential damages. The Court decided that the claim of a tradesman for damages in consequence of the loss of his customers, who had either been drowned or driven from the neighbourhood, could not be sustained. The judgment has, in other points, an important bearing upon the construction of the statute. We may state here a fact which is equally creditable to the claimants and to the company—namely, that out of the total number of upwards of 7,000 claims, no less than 4,707 had been settled up to the 28th ultimo. Of this number, 1,500 have been settled since the previous sitting of the Court.

THE ARCHITECTS OF HALIFAX AND THE CORPORATION BUILDING BY-LAWS.—Recently, a meeting of the architects and land surveyors of Halifax was held on the subject of the new building by-laws of the corporation, and a deputation was then appointed to wait upon the corporation to lay their complaints before the proper authorities. On Wednesday the interview in question took place with the Improvement Committee. Among the architects composing the deputation were Mr. Councillor Nicholson, Mr. Horsfall, Mr. Bull, Mr. Jackson, Mr. J. E. Oates, Mr. Davis, and Mr. Booth. The objections of the architects and land surveyors to the new building by-laws, which were confirmed by the Home Secretary a few weeks ago, are, that a great many plans and copies of plans of intended new buildings and streets must be deposited with the corporation,—more, in fact, than are necessary. Next, the carrying out of the new by-laws will seriously affect the cost of the erection of second and third class dwellings, on account of the greater quantity of land required, and the increased thickness of the walls, &c. Again, an ashpit and privy are to be erected for every cottage, and this, too, they consider unnecessary. Were these by-laws to be carried out, the cost of cottage property would, it is said, be increased at least 25 per cent. The committee promised to further consider the objections advanced.

TESTIMONIAL TO A RAILWAY CONTRACTOR.—A short time since, Mr. M'Henry, the contractor of the Atlantic and Great Western Railway, presented to the city of Philadelphia a battery of artillery of Whitworth guns. The friends of that gentleman in America now return the compliment in the shape of a testimonial, by American artists, which has been exhibited at Messrs. Hunt & Roskell's. According to the *Railway News*, it consists of a dinner, dessert, and tea service, composed of silver, richly chased and gilt; and there is with it a tall column of silver-gilt, round which there winds a spiral and continuous band from the base to the summit, and upon this is engraved the section of the 200 miles of the Atlantic and Great Western Railway, which were completed in as many days by Mr. M'Henry. Every cutting, and embankment, and bridge is shown upon a scale of 18 ft. to 200 miles, and there are engraven upon it 30,000 words and figures—some of them so minute as to require a microscope to decipher them. The summit of the column supports an allegorical figure of America. The cost of the testimonial was about 20,000 dollars. American artists, continues our authority, will not be displeased to hear that this eminent firm of English goldsmiths, so far from being actuated by any desire to depreciate the work, candidly declare that it is one of which they would have been proud to have been the producers.

RAILWAY MATTERS.—The line of railway to unite the London and North-Western with the South-Eastern at Charing-Cross is about to be commenced. It will be an underground line, and, indeed, will cross the present underground on the New-road, at Tottenham-court-road, on a still lower level. New streets will be formed in connexion with this line, as we have noticed on previous occasions, opening up the close streets between Oxford-street and the Strand. This will be the third line of connexion between the North and South of London lines, the three Thames bridges of connexion being Blackfriars, Hungerford, and Kensington.——The traffic receipts of railways in the United Kingdom amounted, for the week ending the 24th of December, on 11,732 miles, to 675,291*l.*, and for the corresponding week of last year, on 11,395 miles, to 612,748, showing an increase of 337 miles, and of 62,543*l.* in the receipts.

THE LADIES' SANITARY ASSOCIATION. — The seventh annual report of this excellent Association states that no less than 90,240 of their popular and useful sanitary and other tracts have this year been distributed amongst the poorer classes, making a total of 703,740;—a moral force which implies a vast extension of really public and popular opinion in favour of ventilation, cleanliness, sobriety, and many other domestic improvements. The lectures got up by the Association also cannot but be of very great importance towards the same desirable ends. The Ladies' Sanitary Association constitute a powerful auxiliary legion in the army of sanitary pioneers. Their benign and subtle influence gains access where no rougher and more masculine power can reach.

ALARMING OCCURRENCE IN A LIVERPOOL THEATRE.—An occurrence, happily unattended with serious consequences, but which shows the necessity of having ample means of egress from places of amusement, took place last week in the Adelphi Theatre, Liverpool. The house was crowded, and an alarm of fire was raised. The greatest excitement immediately took place, and a large number of persons made for the doors. The crushing that ensued was terrific, and several persons were trodden under foot and injured. On order being restored, it was found that the alarm was entirely groundless, and that no fire had taken place.

MONUMENTAL.—Some time ago it was determined to erect at Derby a monument to the late Mr. Alderman Johnson, in recognition of his exertions in promoting improvements in the town. The monument has now been erected on the south-east part of the old cemetery. It is of marble, and is in the form of a Gothic memorial cross, on an hexagonal pedestal, with a moulded base elevated on a step. It stands in the centre of an oblong stone plinth covering the entire grave. The front face of the pedestal contains the inscription. The total height is 13 ft. Mr. Hall, marble cutter, designed and executed the work.

PROGRESS OF BELFAST.—In December, 1860, says the local *News Letter*, the total valuation of the town was 270,930*l*., and in the following year 730 new buildings were erected, valued at 7,877*l*. In 1862 the new buildings numbered 840, but they were rather of a poorer class on the average, and the total valuation of them was but 7,618*l*. In 1863 no fewer than 1,260 new buildings were erected, the total valuation of which was 10,364*l*. In 1864 the new buildings numbered in all 1,403, or very nearly double the number erected in 1861, and the valuation is also nearly double, being 13,667*l*.

VESTRY REPORT OF PARISH OF CHELSEA.—The eighth report of this vestry, for 1863-4, under the Metropolitan Local Management Act, 1855, has been printed by order of the vestry. It is, as usual, a comparatively voluminous document, occupying, with the appendices, no less than 175 octavo pages. The medical officer's report states that fever, not unfrequently epidemic typhus, continued to prevail more or less throughout the year, though, on the whole, not of a malignant character. It generally seized the majority of the inmates of any house among the lower orders which it entered, and in the worst localities spread to several adjoining houses. The deaths attributed to fever, many of which were not typhus, numbered only 39, against 51 in the previous year. These returns, however, end in March last, and therefore do not include cases which have since occurred. Scarlet fever, measles, and whooping-cough carried off 179 children: the mortality from these causes in the previous year was 131. In all the ordinary forms of disease an increase was observed when the death-rate of the year was compared with that of the preceding one.

HORTICULTURAL EXHIBITION IN AMSTERDAM.—It is announced that a universal horticultural exhibition is to take place at Amsterdam in the middle of April next, when a congress of botanists and horticulturists will probably be held. All horticultural produce will be admitted, as well as all the industrial objects relating thereto. The prizes are to consist of thirty gold medals, of the value of 100 florins,* ninety-two medals of fifty florins, 127 medals in vermeil, eighty-four large and seventy-seven other silver medals, and money prizes to a considerable amount.

* A Holland florin = 2·10 francs = 20·16 pence.

DOING THE RIGHT THING.—I mean to try to show, and believe I *can* show, that a simple and sure conviction of our having done rightly is not only an attainable, but a necessary seal and sign of our having so done; and that the doing well or rightly, and ill or wrongly, are both conditions of the whole being of each person, coming of a nature in him which affects all things that he may do, from the least to the greatest, according to the noble old phrase for the conquering rightness, of "integrity," "wholeness," or "wholesomeness." So that when we do external things (that are our business) ill, it is a sign that internal, and, in fact, that all things, are ill with us; and when we do external things well, it is a sign that internal, and all things, are well with us. And I believe there are two principal adversities to this wholesomeness of work, and to all else that issues out of wholeness of inner character, with which we have in these days specially to contend. The first is the variety of Art round us, tempting us to thoughtless imitation; the second our own want of belief in the existence of a rule of right.—*John Ruskin, in the Art-Journal.*

A NEW CAB.—We lately drew attention to the dangerous nature of the "safety cabs" called Hansoms. Since then we have heard of four-wheeled Hansoms, if they can still be so called. Whether the following, extracted from a Liverpool paper, be of this kind we do not know; but the notice shows that the subject is under the consideration of mechanical minds: — "Mr. Gorst, formerly a coachbuilder in Liverpool, has invented a new patent safety-cab, the principle of which is to facilitate the draft by the use of wheels of increased diameter, and to admit of the centre of gravity being lower than in ordinary vehicles. Mr. Jones, car proprietor, of Liverpool, has introduced a Hansom cab built by Mr. Findlater, of Birmingham, on this principle, which seats four persons, and has wheels 5 ft. 7 in. in diameter. The motion is very smooth and easy."

CONTEMPLATED IMPROVEMENTS AT KNARESBOROUGH.—The Rev. James Fawcett, vicar, at a tea meeting in the Town-hall, Knaresborough, referred to certain objects which must be brought before the parishioners. He instanced the remodelling and enlargement of the present organ at the parish church as being a necessity, and the complete restoration of the church itself. At Trinity Church, he said, a better approach was much needed. A paper was read on "Bells," by the Rev. H. Fawcett, in which he said that if the peal of bells at the parish church were not quarter-tuned, they would become seriously injured, judging from the deep indentation already made by the clappers in the parts where they strike. It is stated that the six o'clock bell is now half worn through. The value of the present peal, even as ordinary bell-metal, is upwards of 600*l*.

METROPOLITAN BENEFIT SOCIETIES' ASYLUM.—The annual treat to the inmates of this Institution, in the Ball's-pond-road, was given on Monday, when they were regaled with a dinner of good old English fare. The chairman, Mr. J. T. Slater, stated the Asylum had provided a home for 165 persons, of whom 34 now remained, and he was glad to say, living very happily. The Society had now 7,145*l*. capital invested in the Public Stocks. In proposing "The Friendly Societies of Great Britain," the secretary said that about 130 of those in the metropolis and neighbourhood subscribed, and he wondered that more did not see it to their interest to give the Institution substantial support, being for the benefit of their members only.

TENDERS.

For alterations and addition to Mr. Bowly's House, High-street, Swindon. Mr. Thomas S. Lansdown, architect:—

Hopkins	£550	0	0
Phillips	548	0	0
Barrett (accepted)	530	0	0

For a new house and offices on the Kilrush estate, near Limerick, for Mr. Thomas Revington. Mr. William Fogerty, Dublin, architect. Quantities supplied by Mr. E. P. Gribbon. Amounts exclusive of plate-glass, chimney-pieces, and ironmongery:—

W. & A. Roberts	£5,500	0	0
Meade	5,195	0	0
Crowe, Brothers	5,000	0	0
Hunter	4,700	0	0
Ryan & Son	4,642	0	0
Scanlan (accepted)	4,340	0	0

For the erection of artist's studio, No. 83, City-road. Mr. Dennison, architect:—

Garrod	£629	0	0
Anley (accepted)	536	0	0

Accepted for the erection of farm buildings at Eudcliffe Hall, Sheffield, for Mr. John Brown. Messrs. Flockton & Abbott, architects. Thirteenth contract:—

Mason's Work.			
Wade	£1,200	0	0
Carpenter's Work.			
Gibson	£390	0	0
Slater's Work.			
Brown & Sons	£117	15	0
Plasterer's Work.			
Harrison	£46	9	0
Plumber's, Glazier's, and Painter's Work.			
Townsend	£110	10	0
Smith's Work.			
Ellis	£143	10	0

Fulham Cemetery.—Contract No. 1.

For erecting and finishing Episcopal chapel, Nonconformist chapel, entrance lodge, boundary wall, and piers. Mr. A. W. Blomfield, architect. Quantities supplied by Mr. J. A. Bunker:—

Kelly	£3,546	0	0
Snelling	3,199	0	0
Chamberlain	3,191	0	0
Turner & Sons	3,071	0	0
Wright	3,030	0	0
Harris	2,841	16	0
Eydmann	2,838	0	0
Adamson & Sons	2,790	0	0
Holland & Son	2,700	0	0
Robinson (accepted)	2,666	0	0
Palmer	2,643	0	0

Contract No. 2.

For laying out, draining, and planting. Quantities not supplied:—

Turner & Sons	£599	6	0
Armstead	420	0	0
Rutty	412	15	6
Strickson	405	0	0
Leeks	340	6	0
Bull	320	0	0
Clarke	319	0	0
Pezzey	307	10	0
Neal	295	0	0
Cole & Co.	280	0	0
Robinson (accepted)	240	0	0

Contract No. 3.

For wrought iron railings and gates. Quantities not supplied:—

Johnson, Brothers	£1,120	0	0
Smith & Son	940	0	0
Hill & Smith	895	0	0
Robinson	835	0	0
Selden	700	5	0

For police station at Northfleet, Kent:—

Higgins	£2,136	0	0
Naylar	1,811	0	0
Pell	1,750	0	0
Norris	1,710	0	0
Chambers	1,700	0	0
Blake	1,695	0	0
Stamp	1,690	0	0
Gould	1,684	0	0
Anscomb (accepted)	1,667	0	0

For the erection of a school-room, &c., Love-lane, Shadwell:—

Thompson	£787	0	0
Hall	694	0	0
Holmes	648	0	0
Stone & Pearce	580	0	0
Nagle	565	0	0
Palmer	510	0	0

For addition to schools, Hackney Union. Henry Norris, architect:—

Thompson	£1,200	0	0
Holmes	1,014	0	0
Harding	987	0	0
Nagle	909	0	0
Sawyer	874	0	9
Snewin, Brothers	867	19	6
Maaers	849	0	0
Wood	839	0	0
Skinner	834	0	0
Stone & Pierce	823	0	0

TO CORRESPONDENTS.

T. H. H.—T. M. B.—J. S. A.—J. W. D.—R. C. S.—E.—B. & I.—H. N. H.—W. S.—R. R. B.—J. A. B.—W.—A. J.—P. & B.—E. H.—F. R. C.—C. H.—F. & A.—S. S.—W. C.—Mr. C.—T. P.—T. J.—S.—M. J. L.—A. B. H.—H. P. K.—C. H. D. (send only original matter).—A Novice (such structures of wood are illegal).—W. C. (we have no desire to identify the exact locality of the query. The statement shall be kept in mind).—E. A. (varies greatly and depends on circumstances).—W. V. S.—R. & G.—H. P.—W. J. C.—Fairplay.—J. B.—G. A.—Tiling (several letters received on this subject).—J. H. (claim shall be inquired into).—S. T.—C. E. D.—Inquirer (as a rule, yes; but it is not always necessary).—T. E. K.

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender; not necessarily for publication.

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